

FIG. 1A1

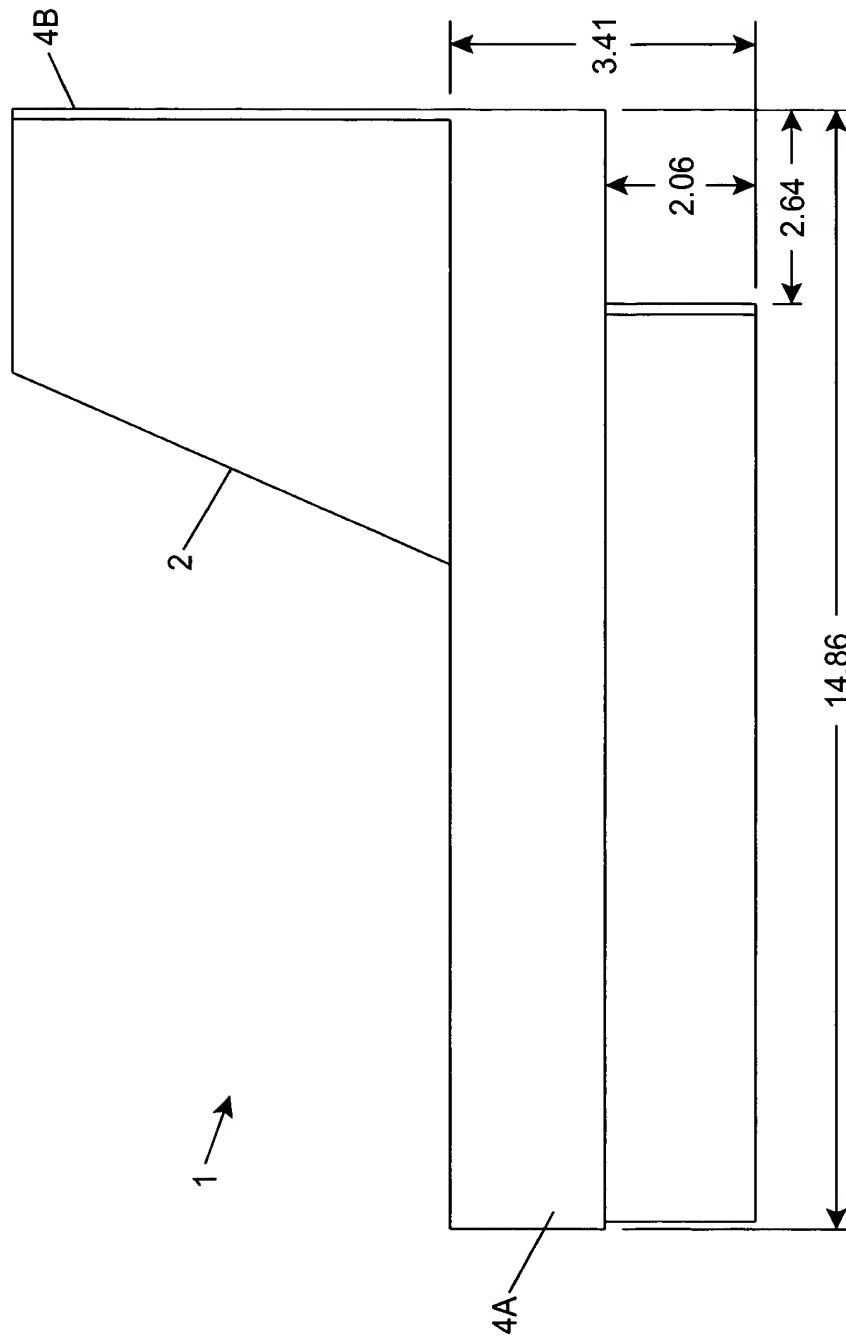
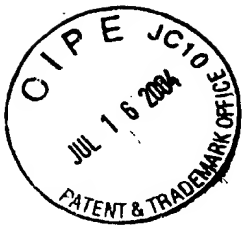


FIG. 1A2

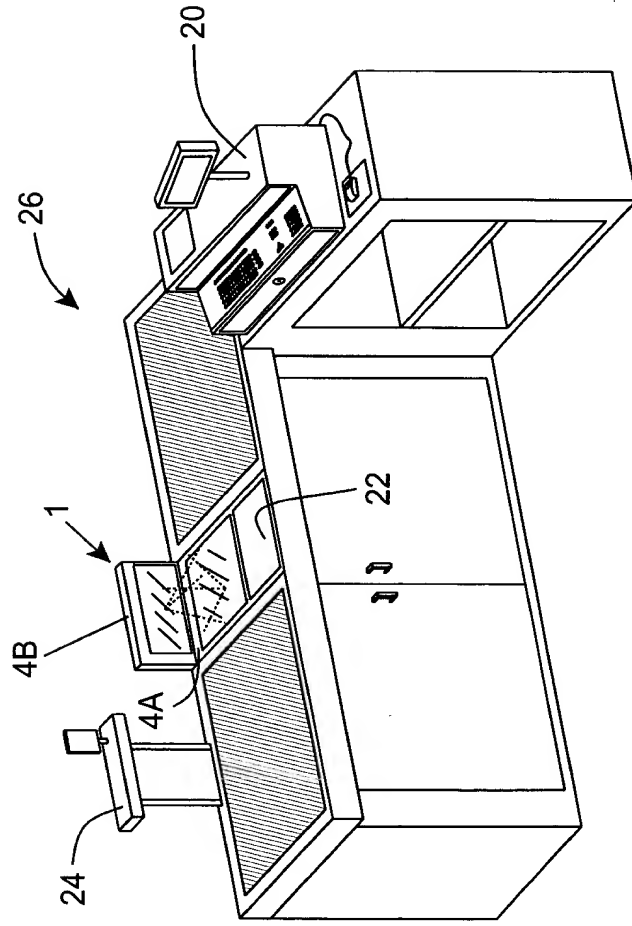
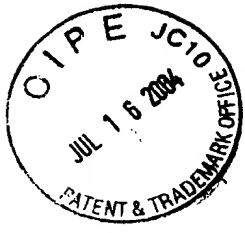


FIG. 1B

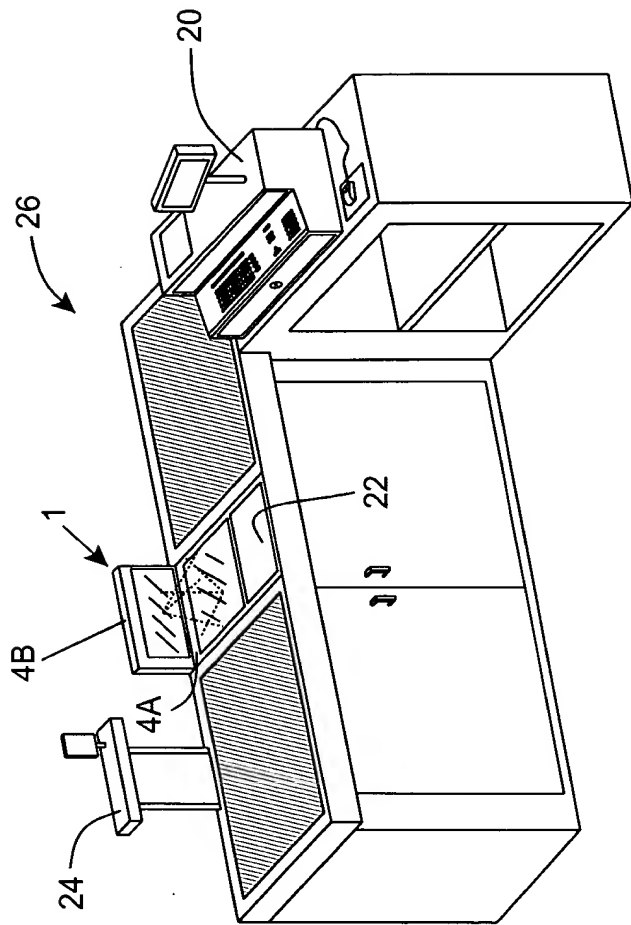
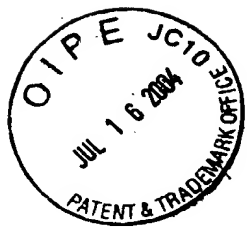


FIG. 1B1

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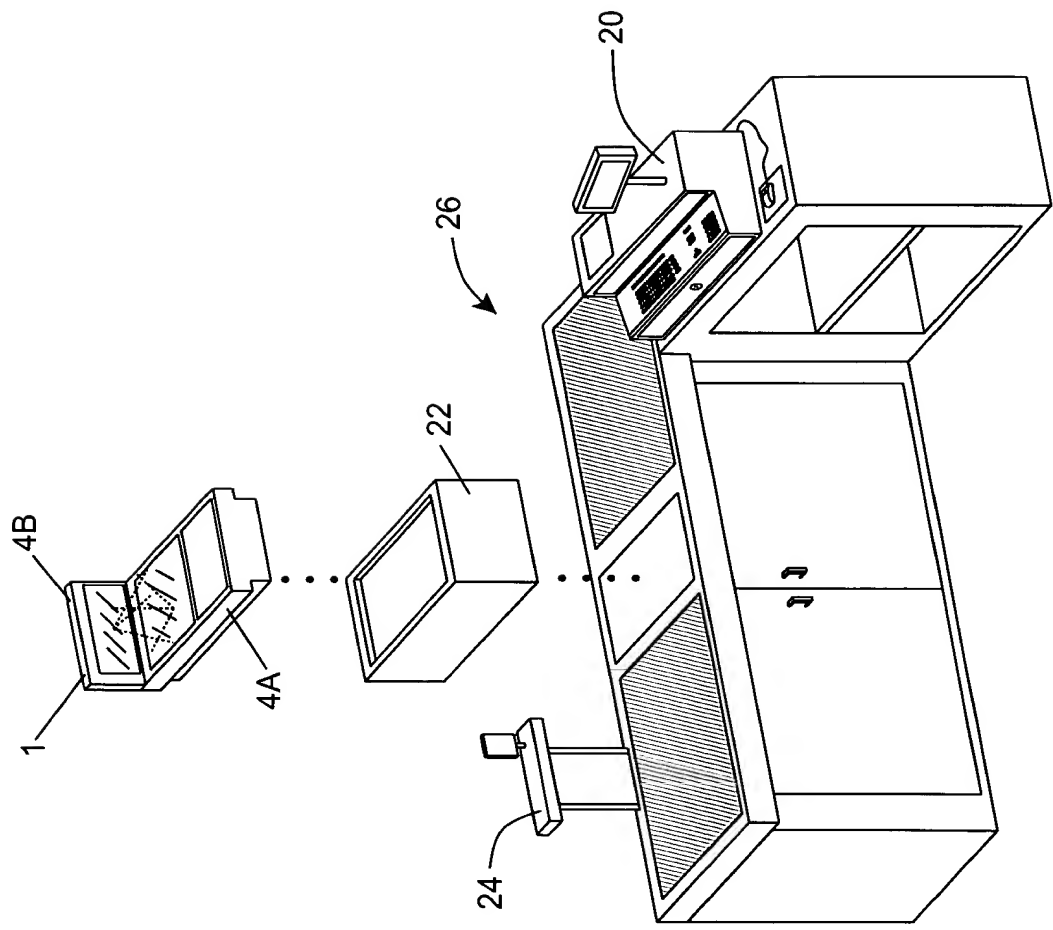


FIG. 1B2

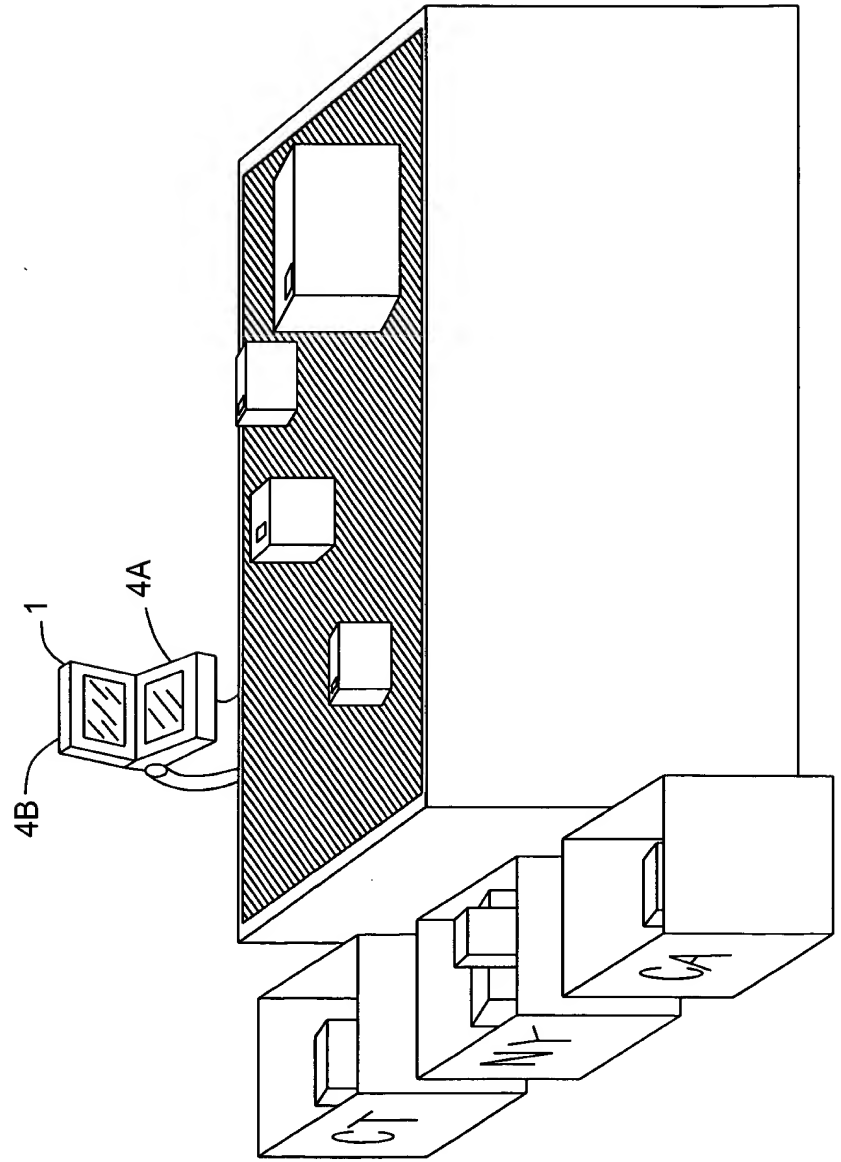


FIG. 1C

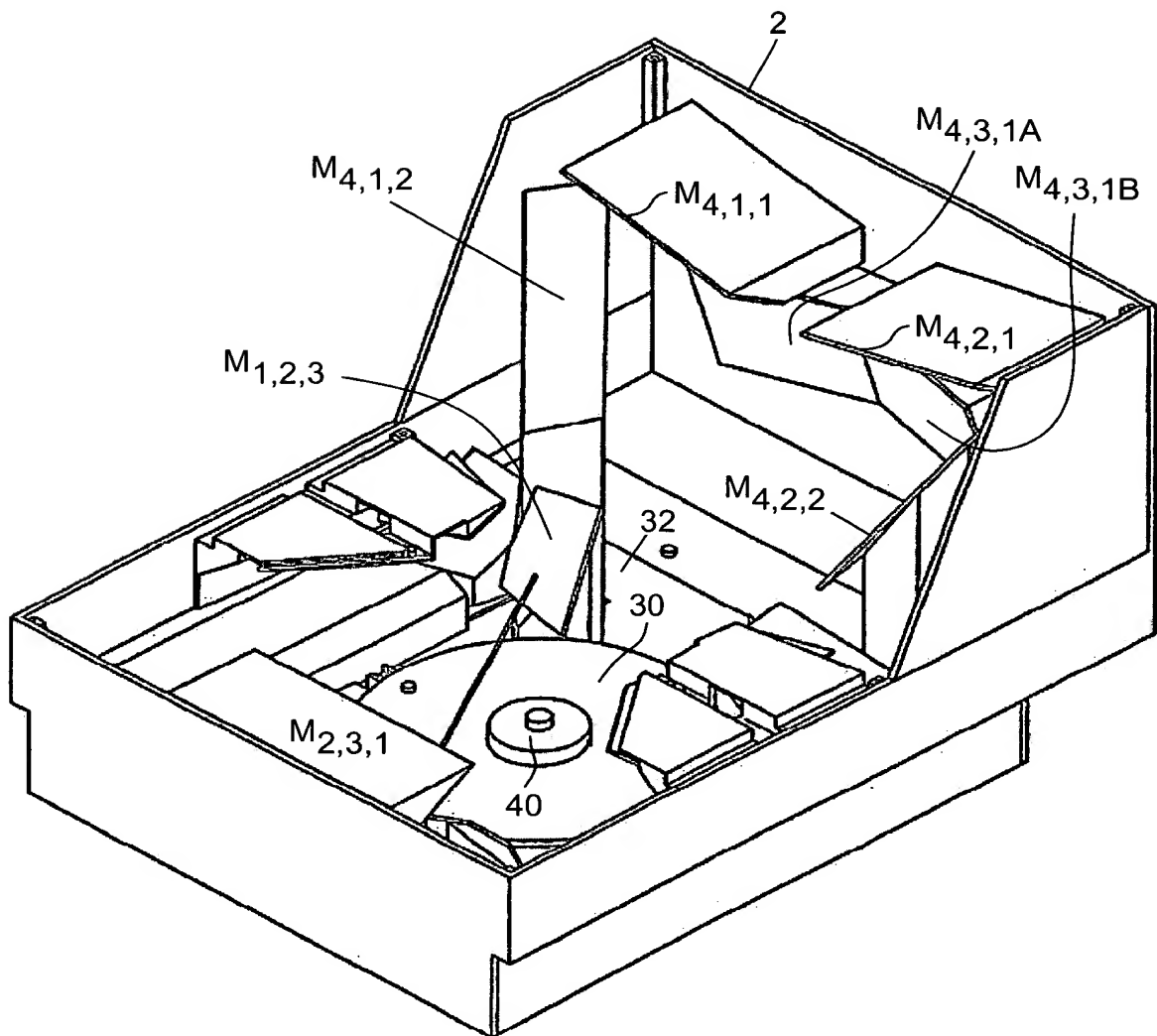


FIG. 1D1

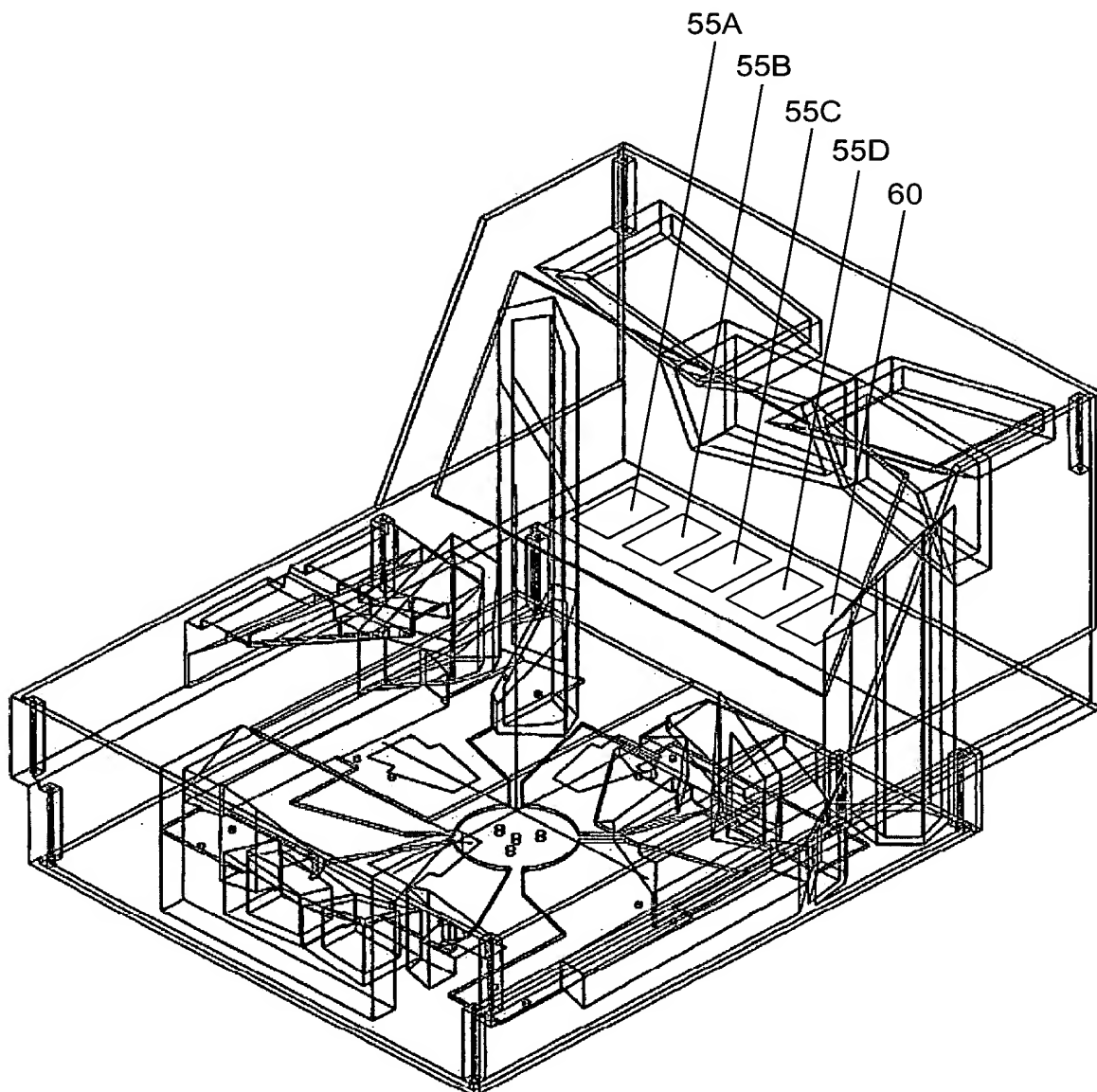
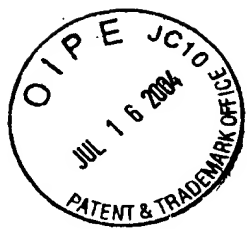


FIG. 1D2

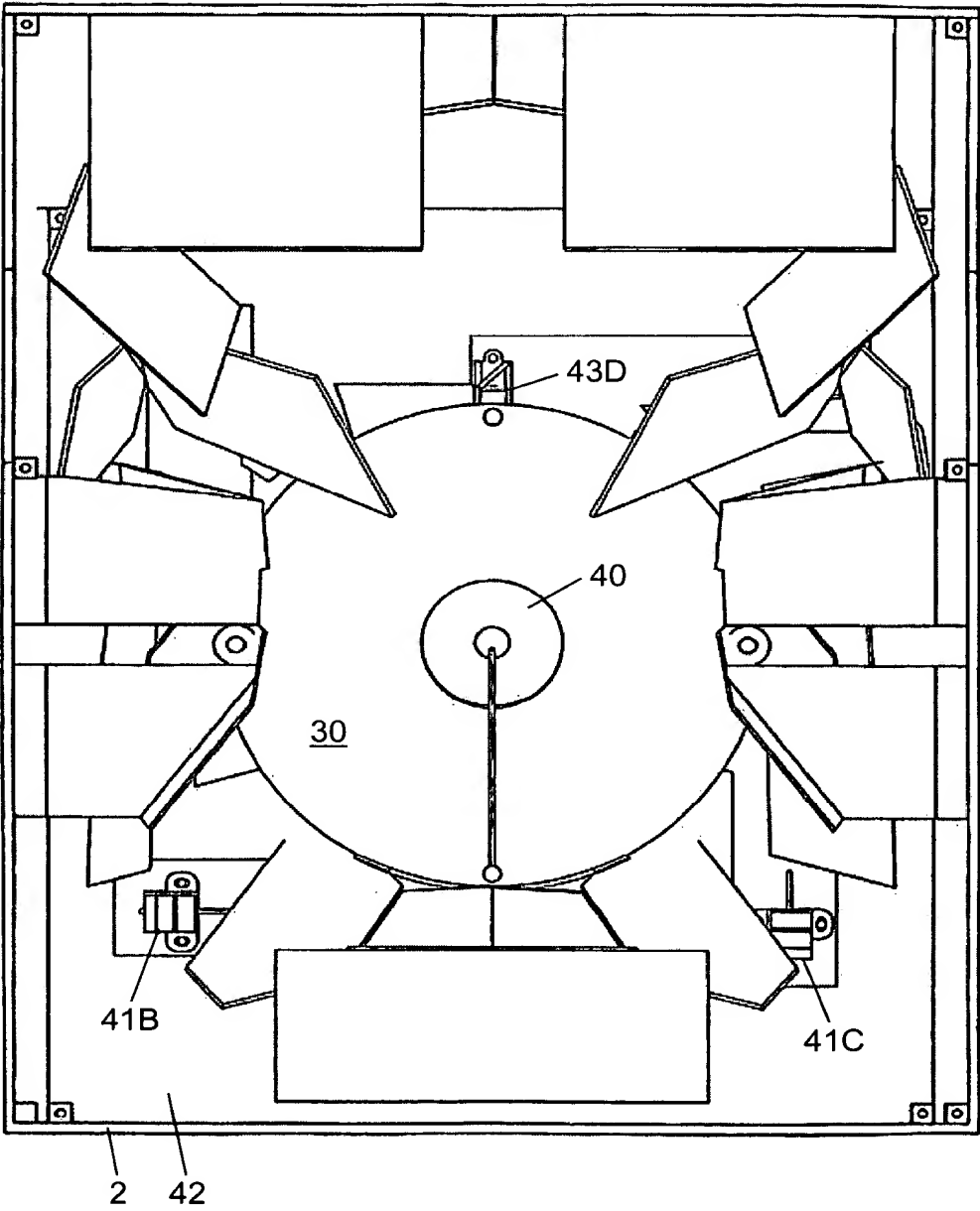
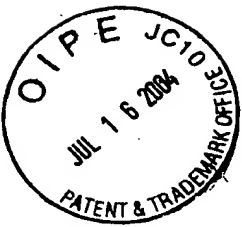


FIG. 1E

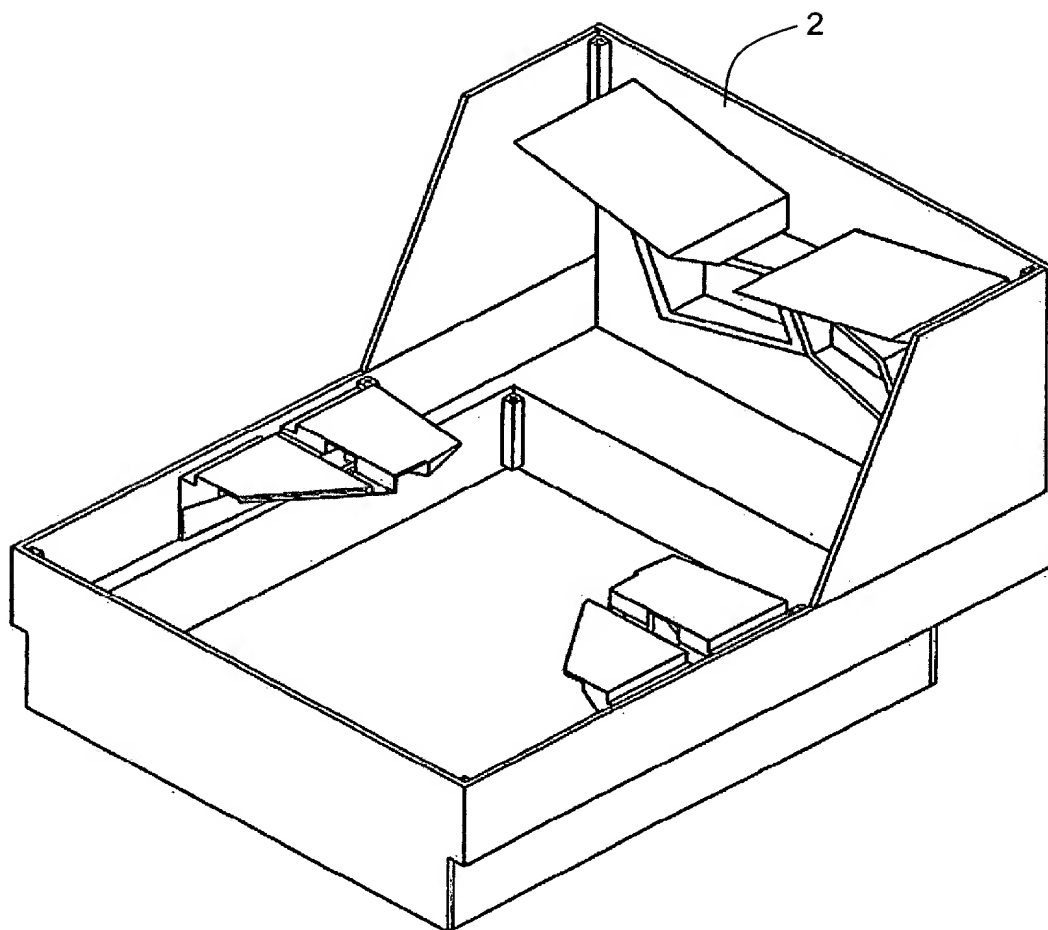
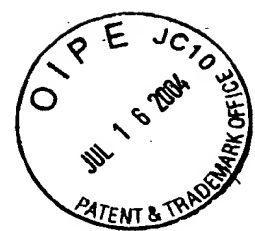


FIG. 1F

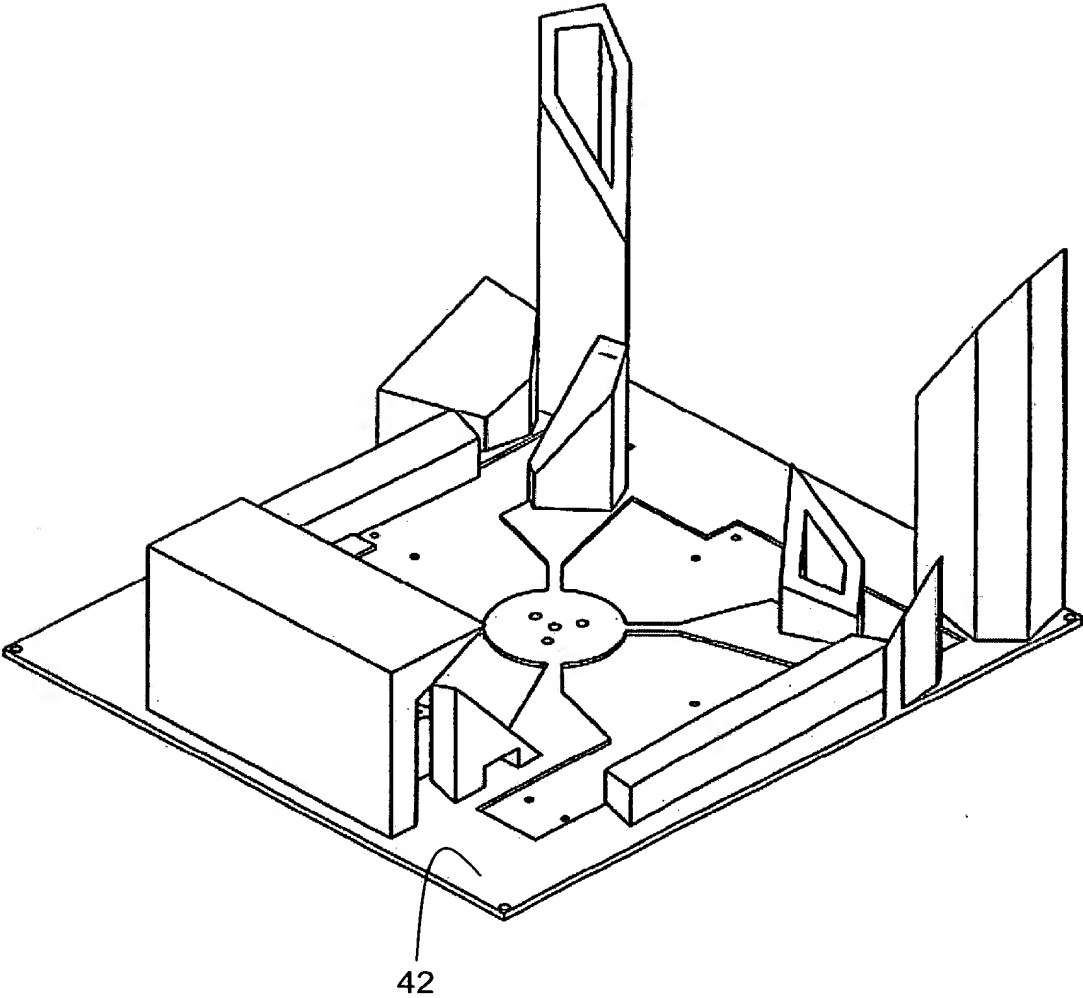
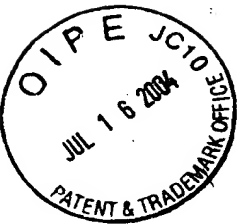


FIG. 1G

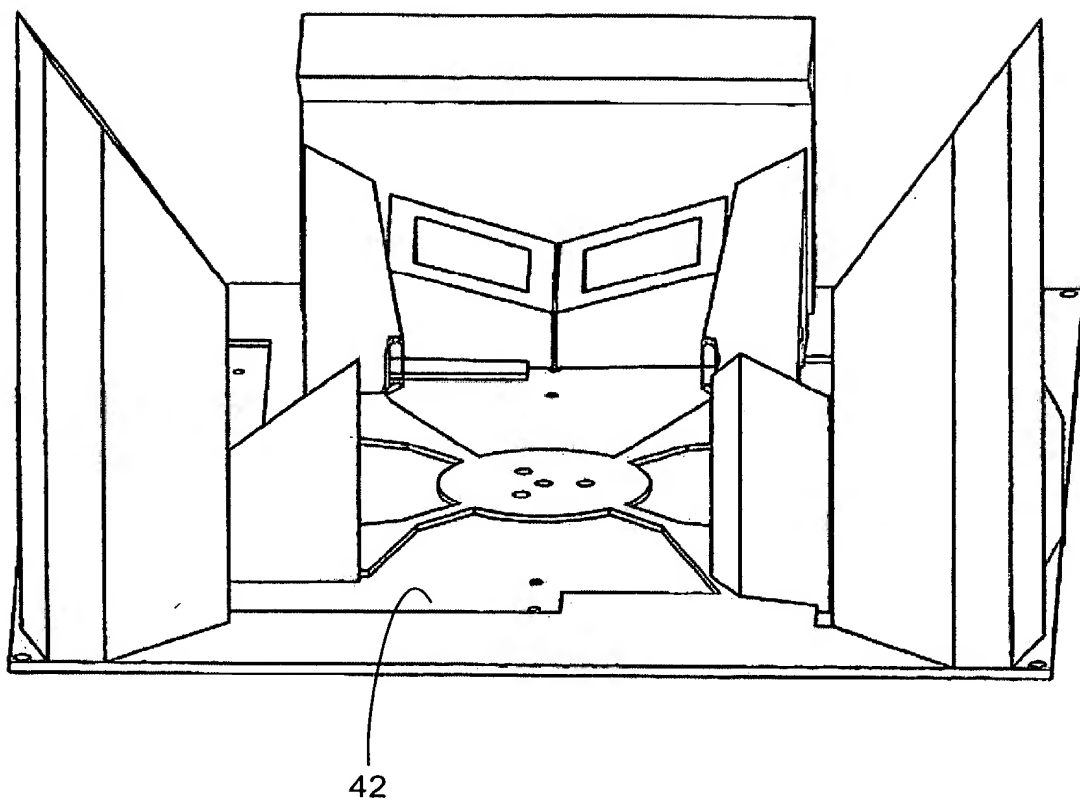
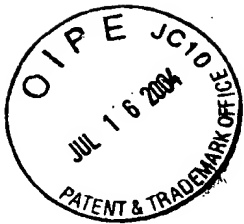
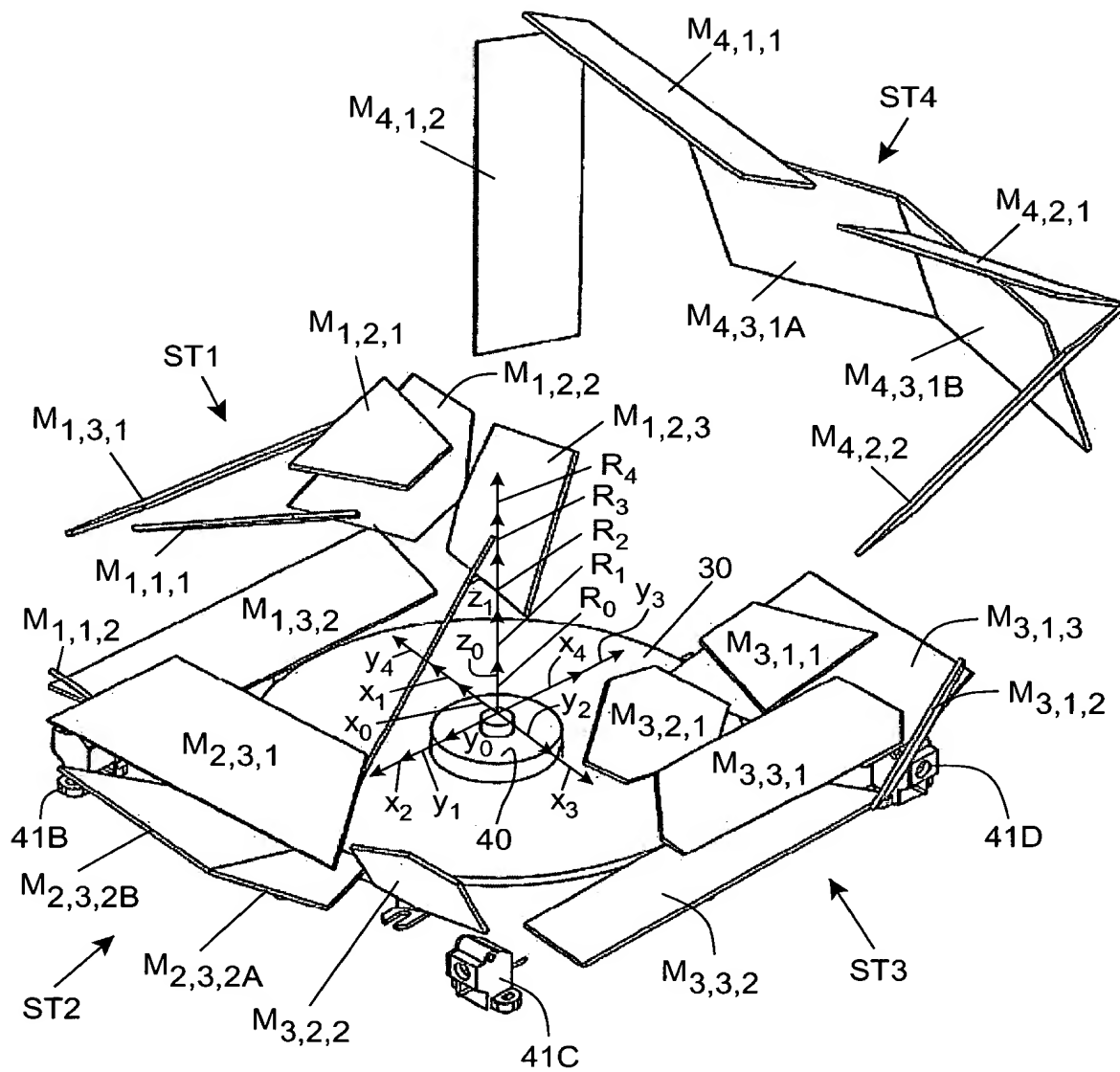


FIG. 1H



Define: R_1, R_2, R_3, R_4, R_0

FIG. 2A1

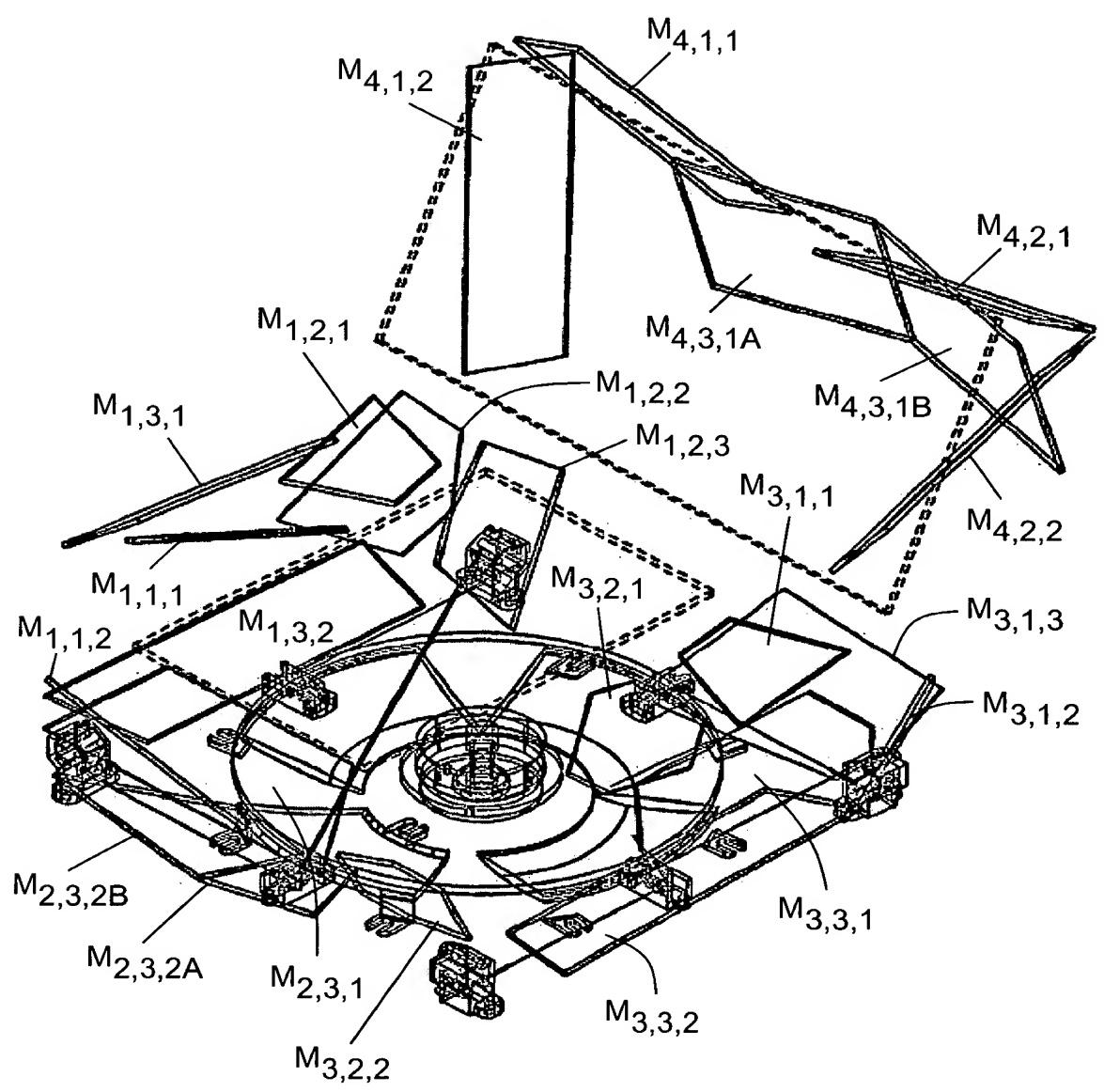


FIG. 2A2

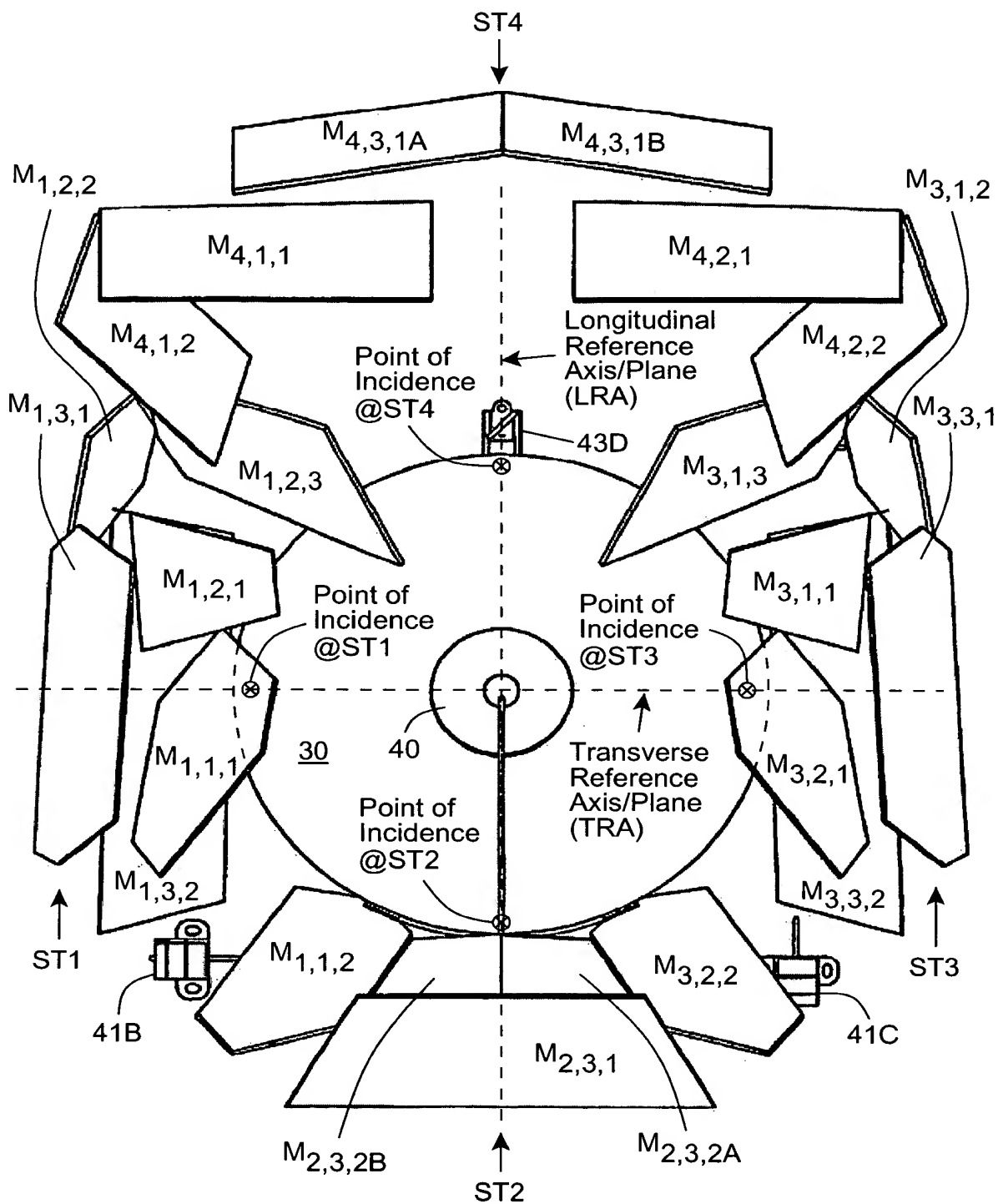


FIG. 2B1

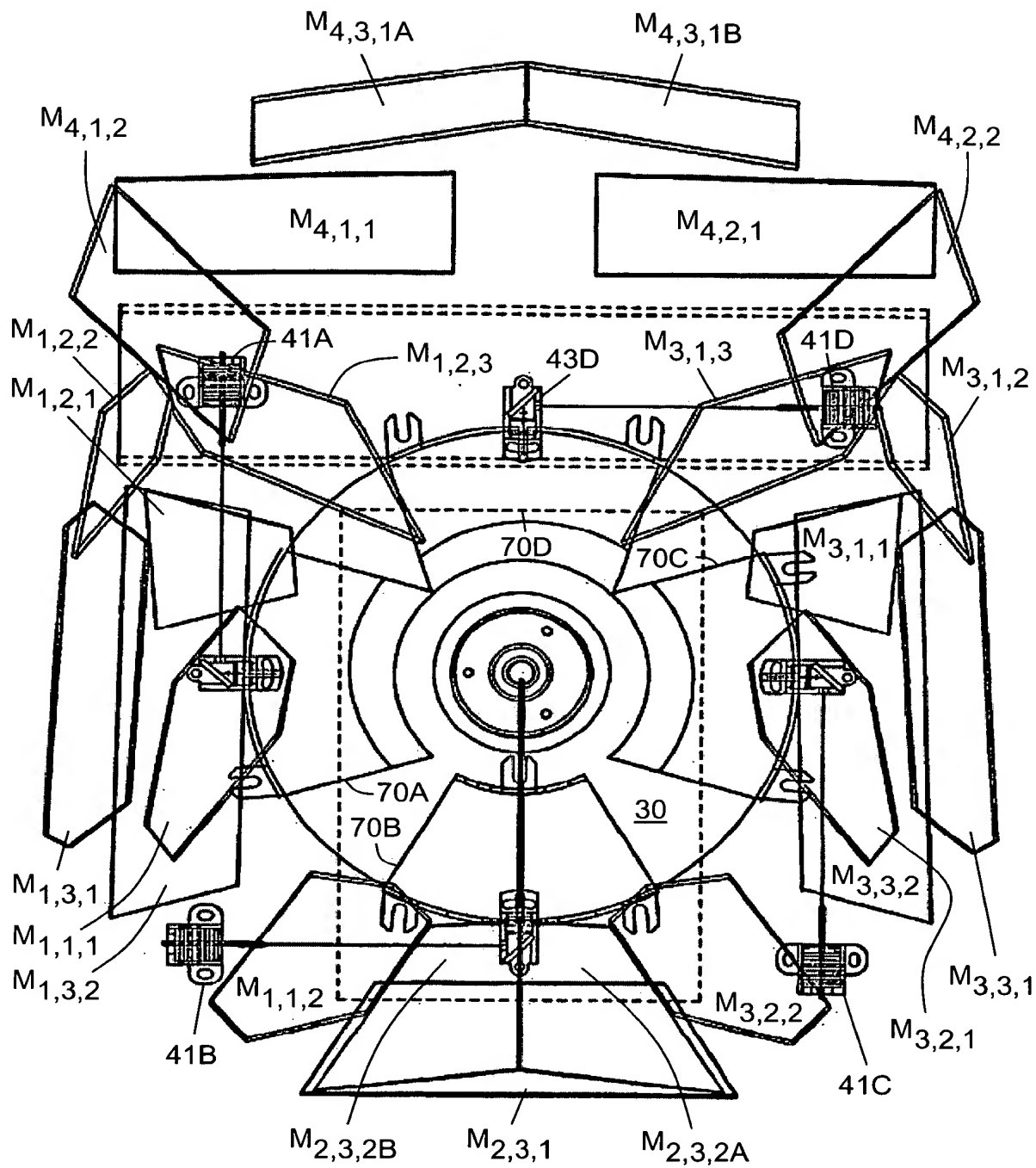


FIG. 2B2

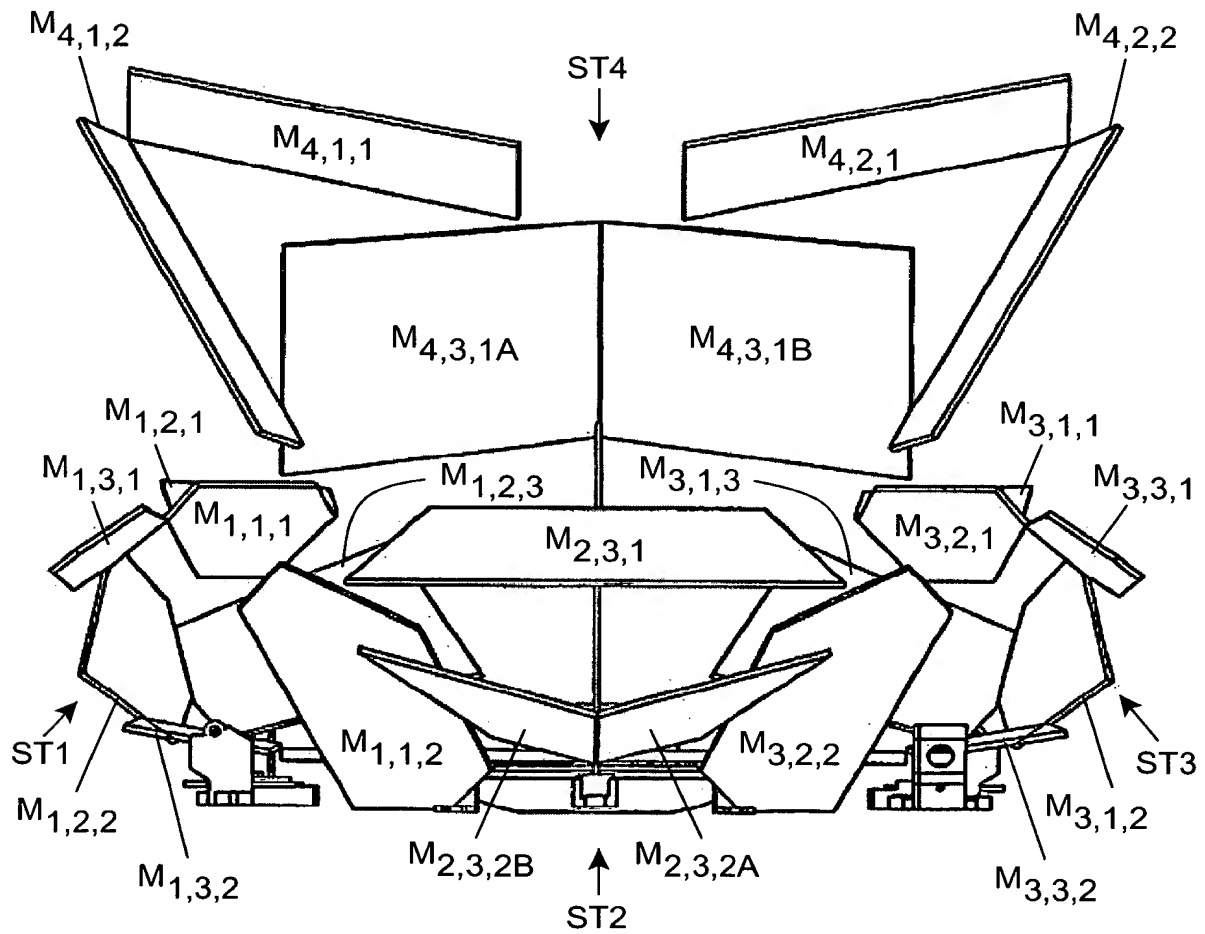


FIG. 2C1

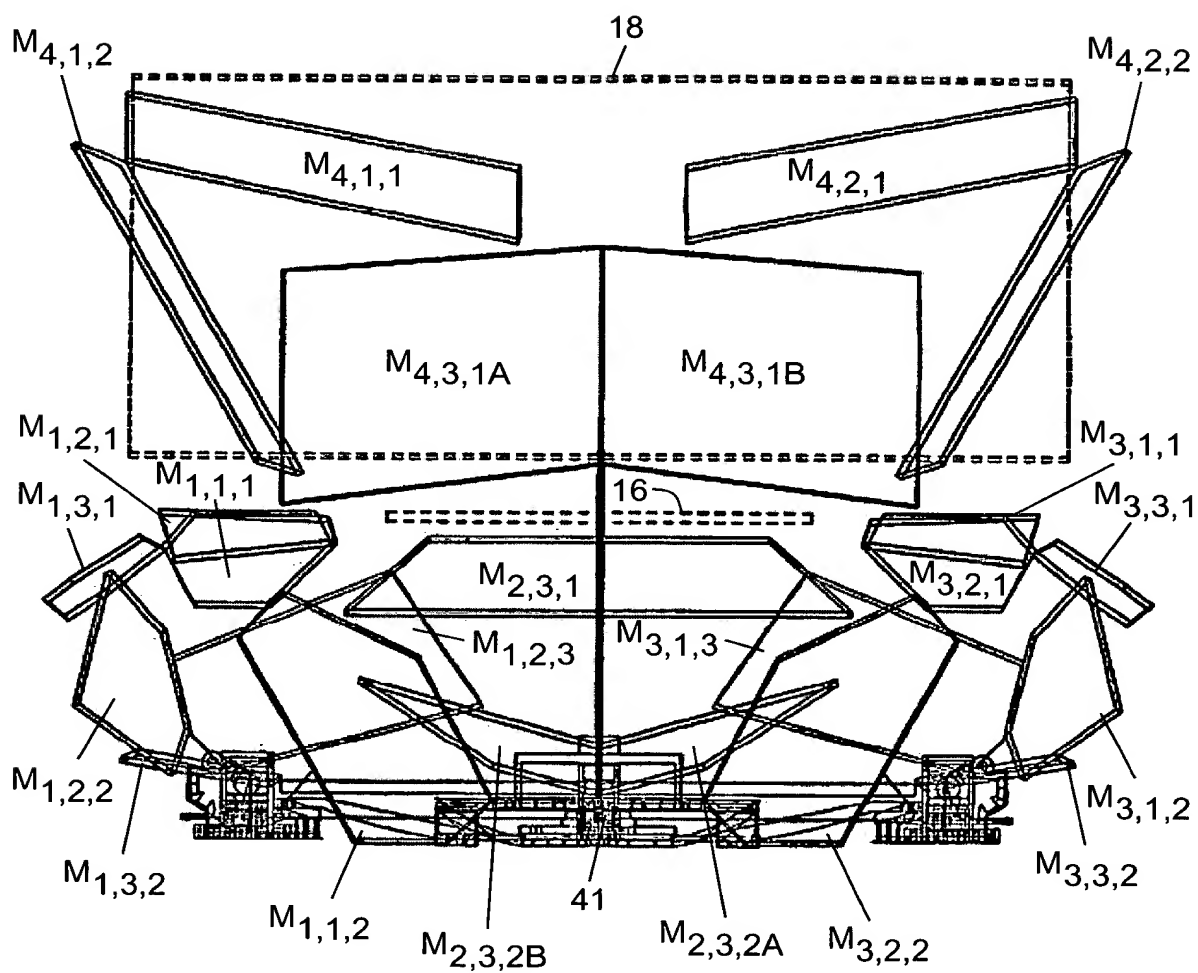


FIG. 2C2

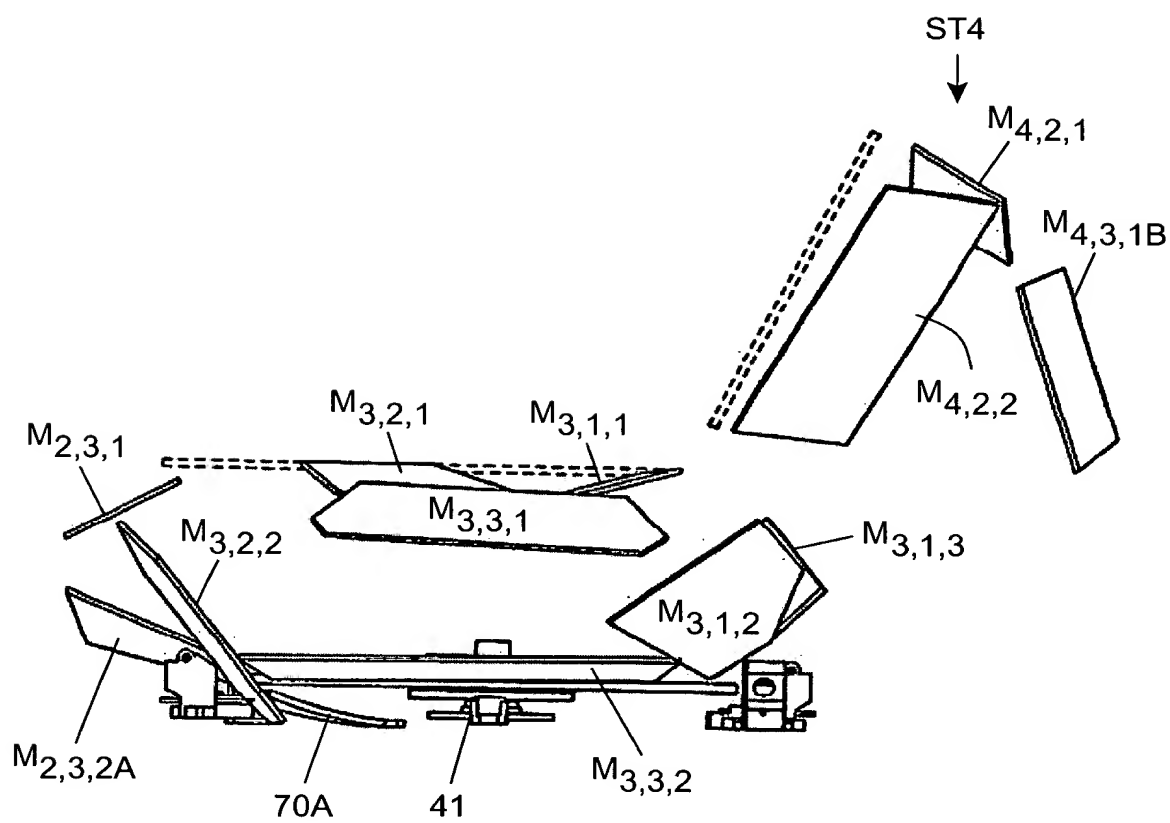
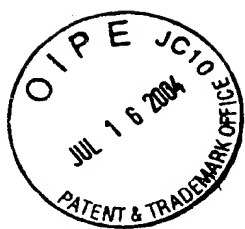


FIG. 2D1

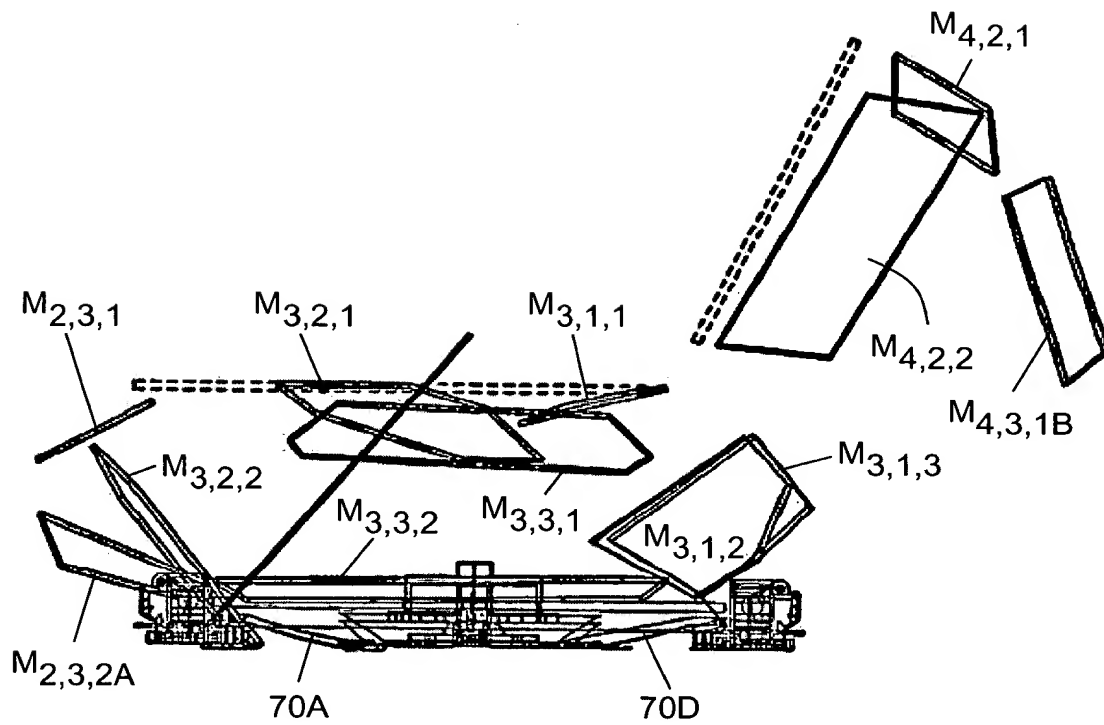


FIG. 2D2

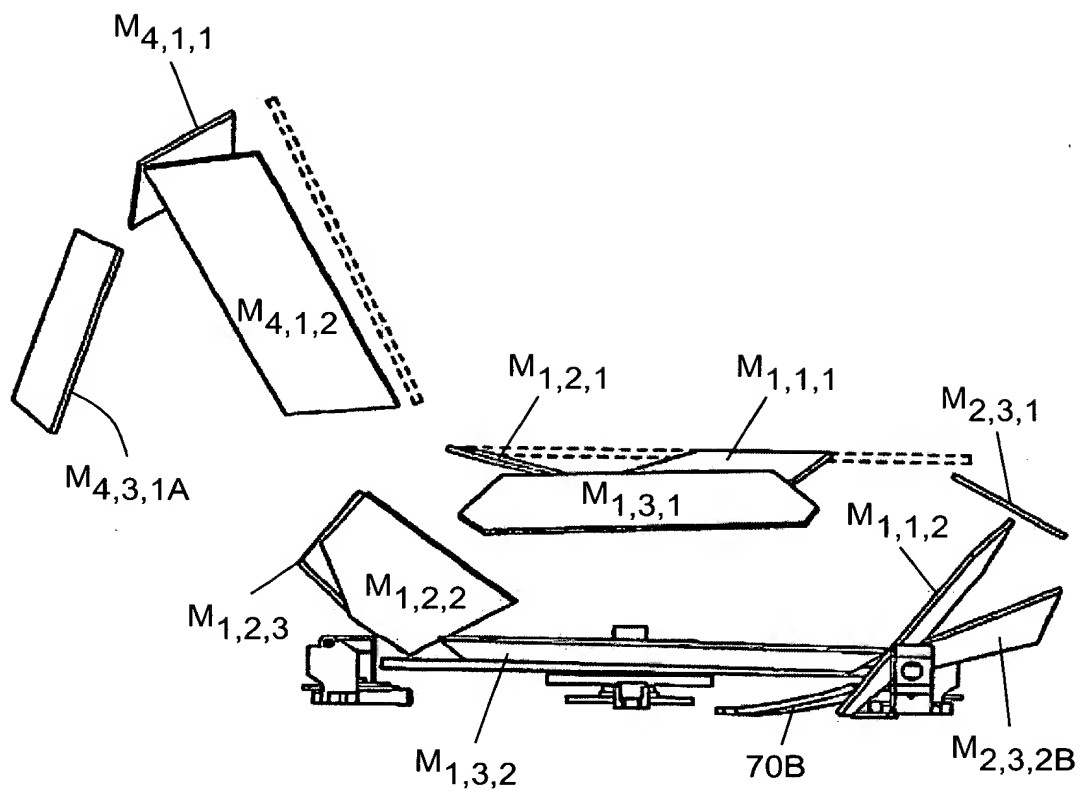


FIG. 2E1

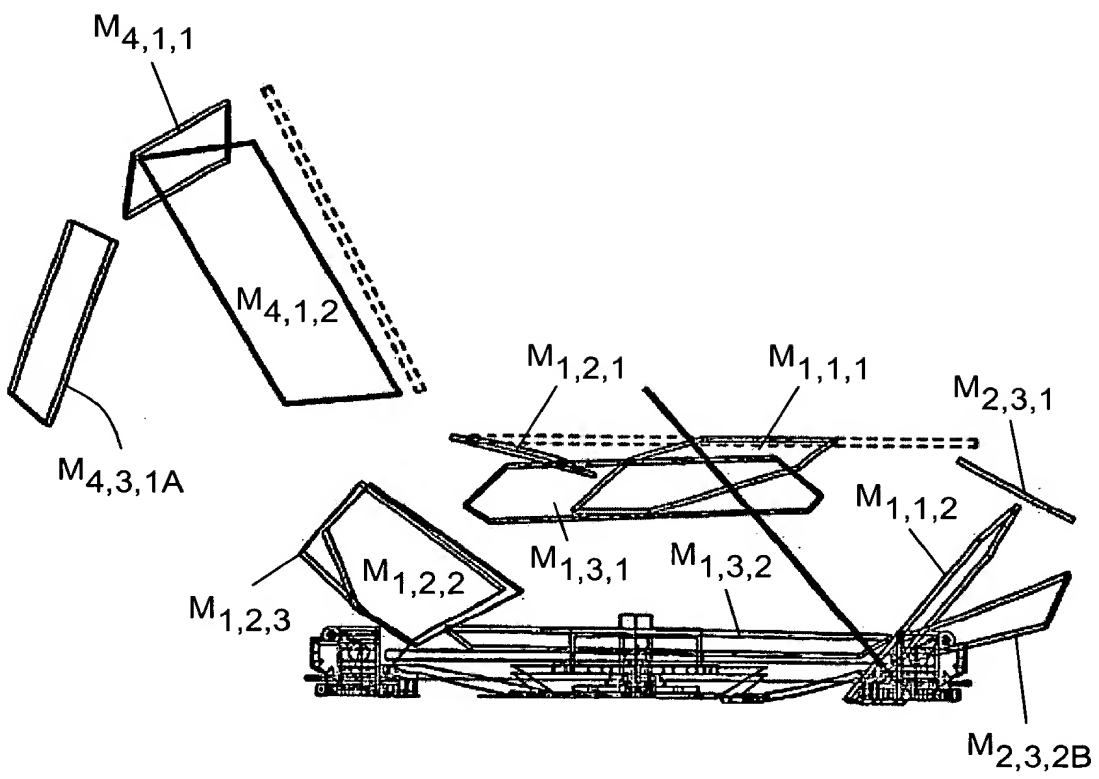


FIG. 2E2

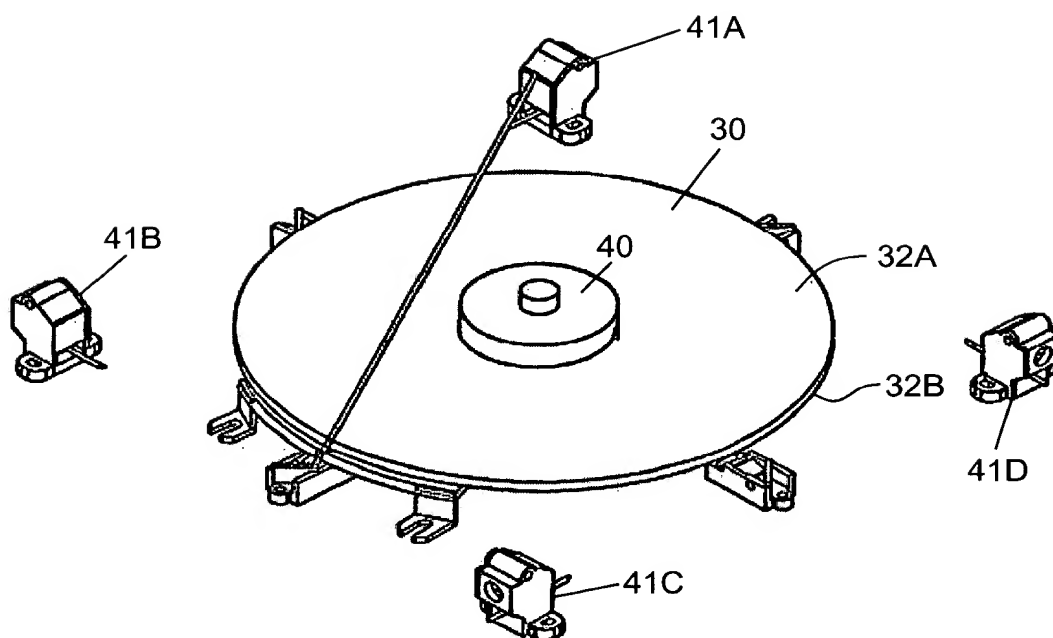
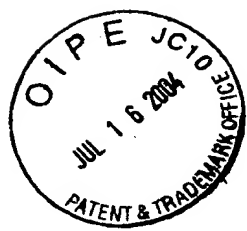


FIG. 2F1

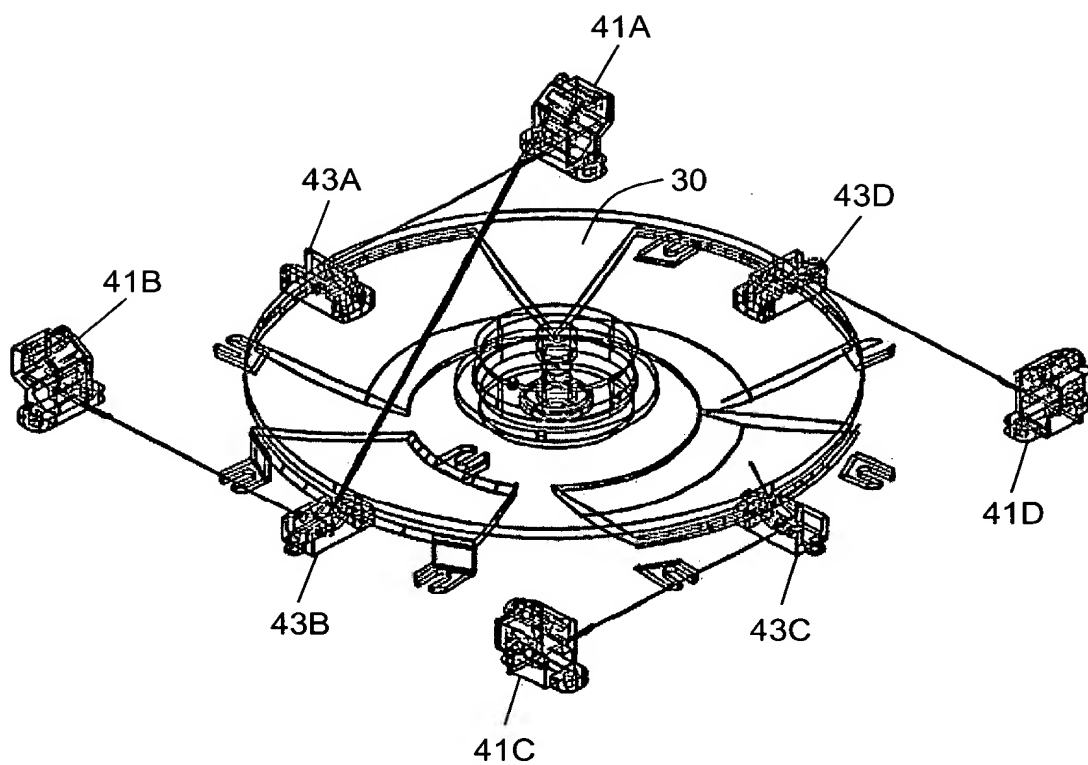
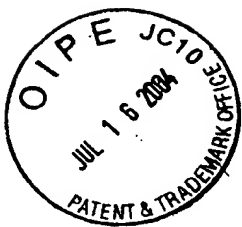


FIG. 2F2

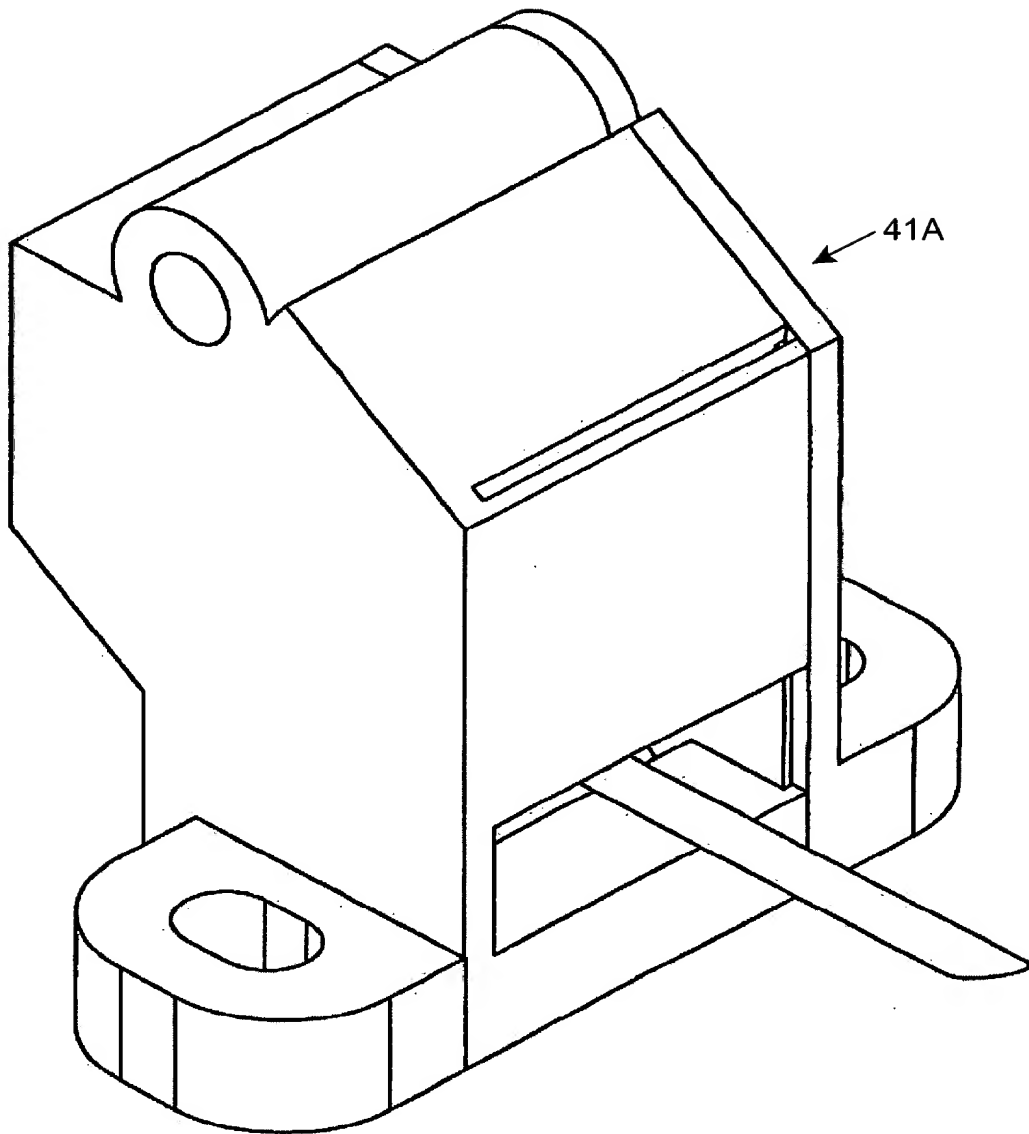
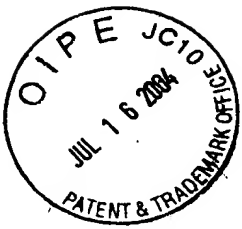


FIG. 2G1

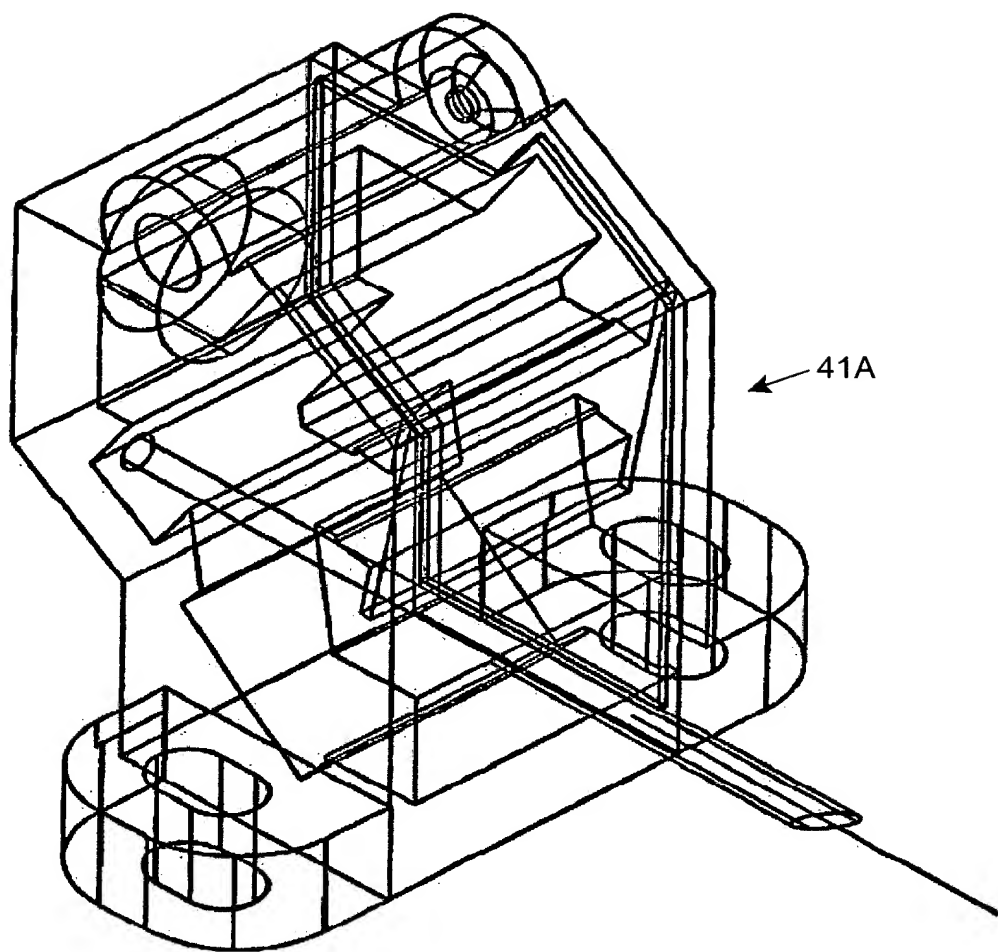
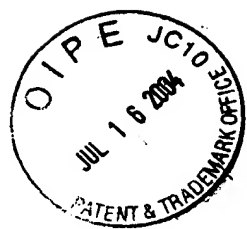


FIG. 2G2

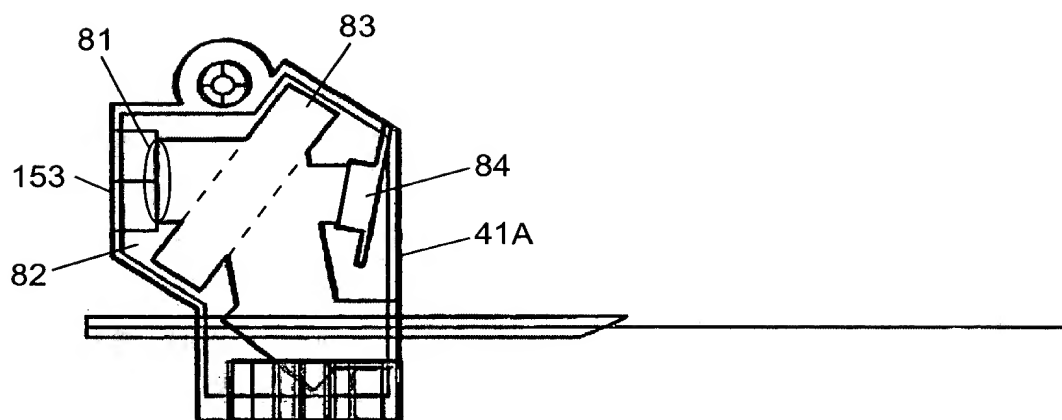
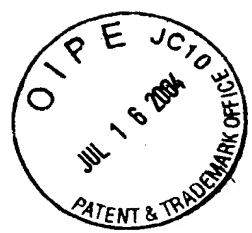


FIG. 2G3

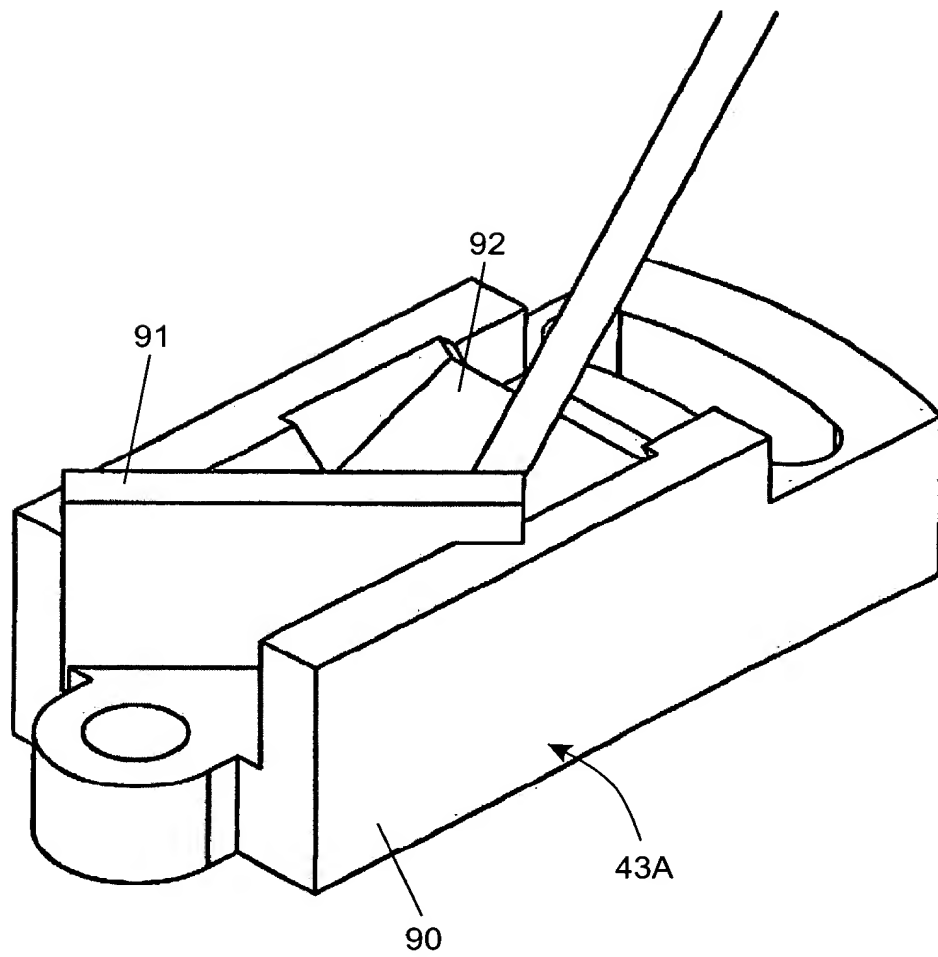
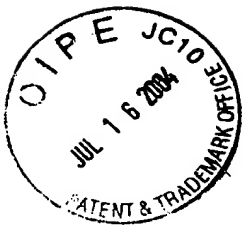


FIG. 2H1

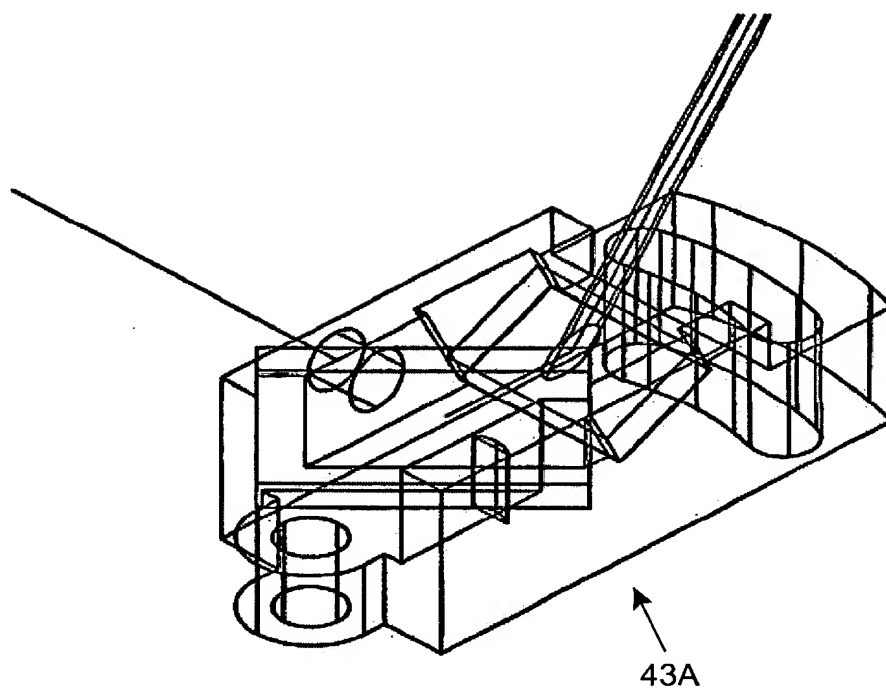


FIG. 2H2

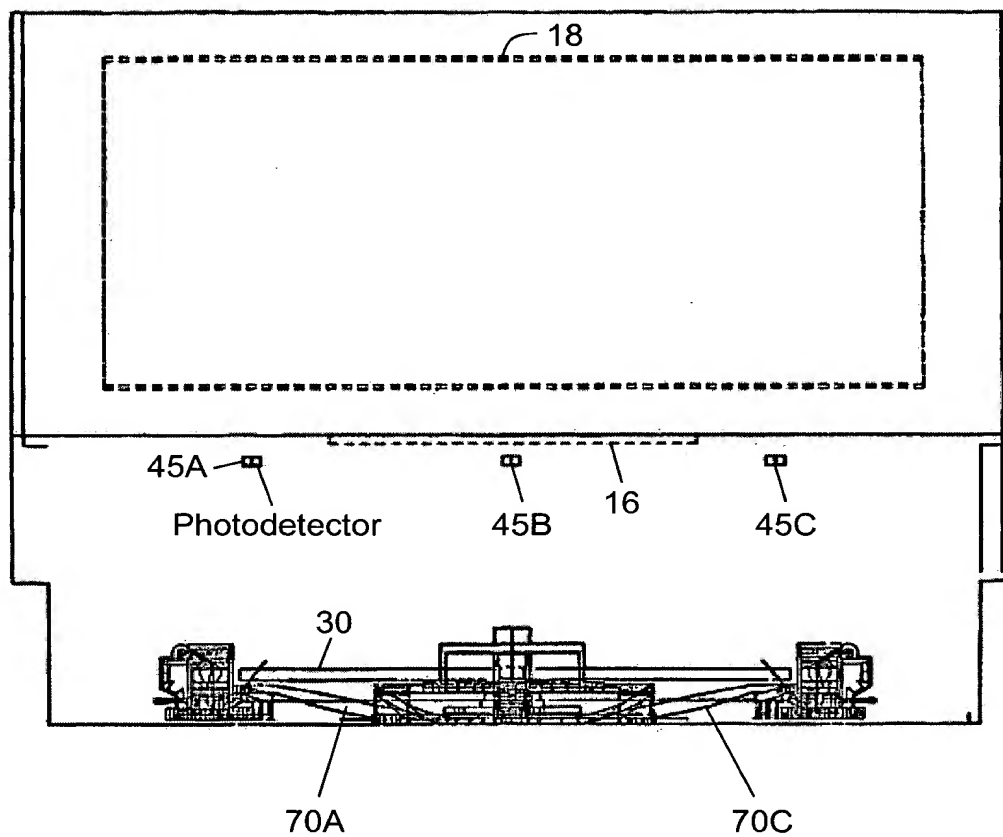
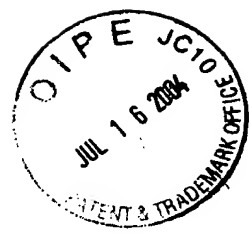


FIG. 211

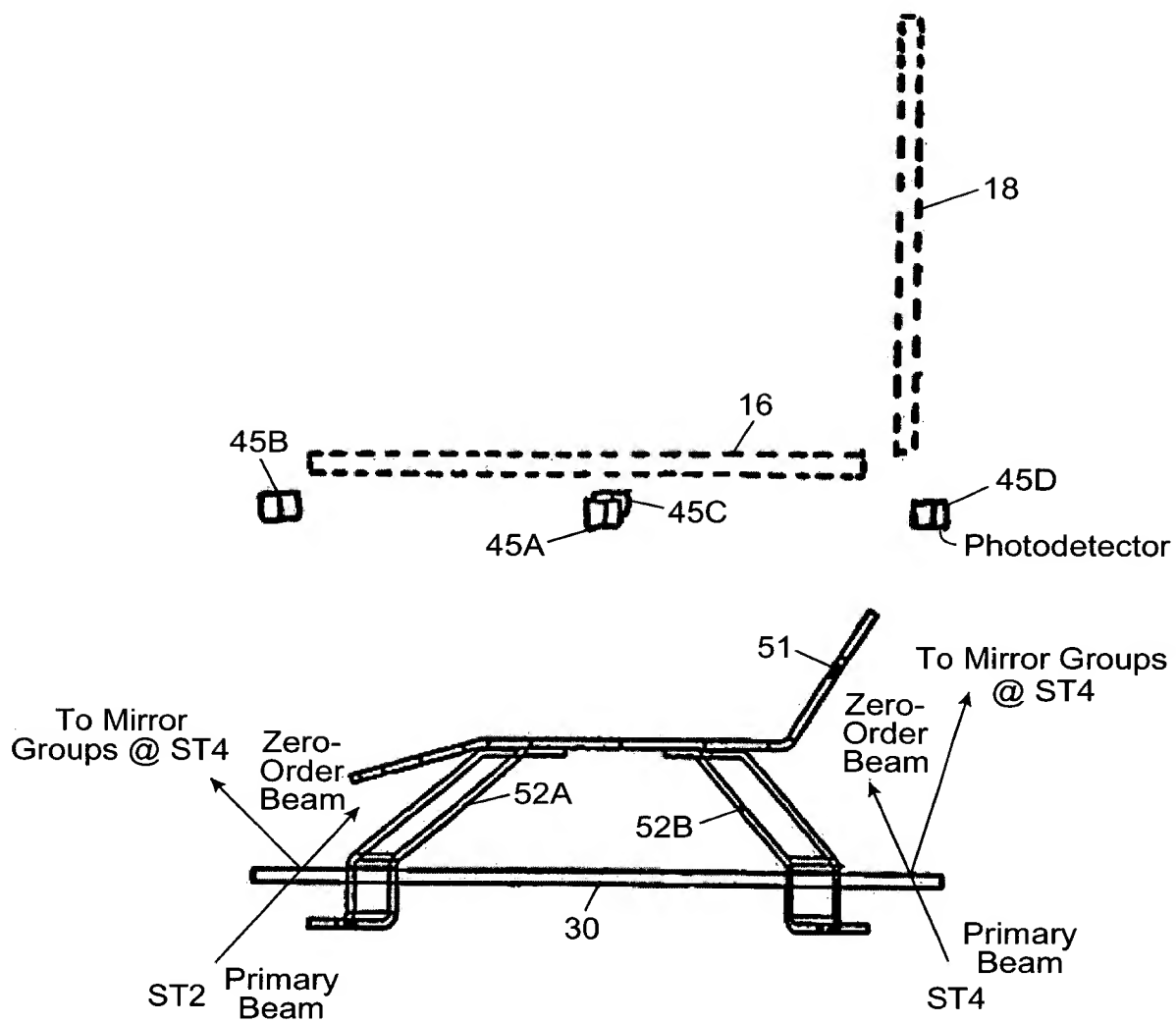
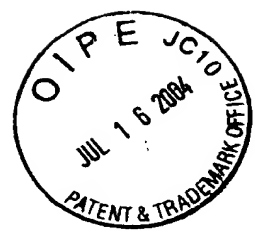


FIG. 212

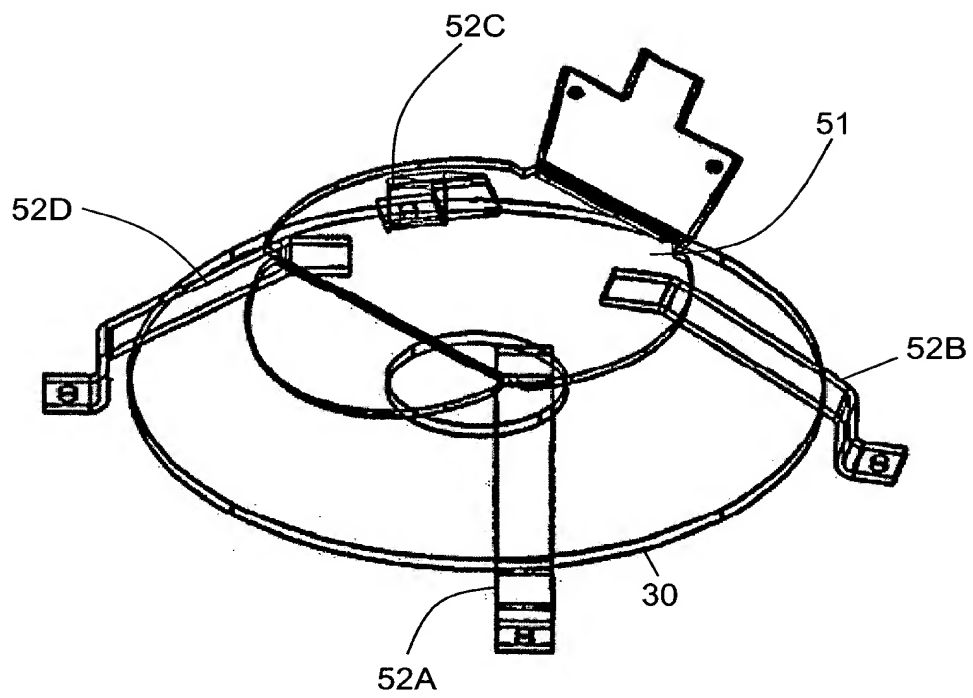
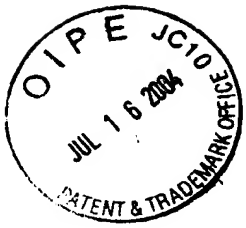


FIG. 213

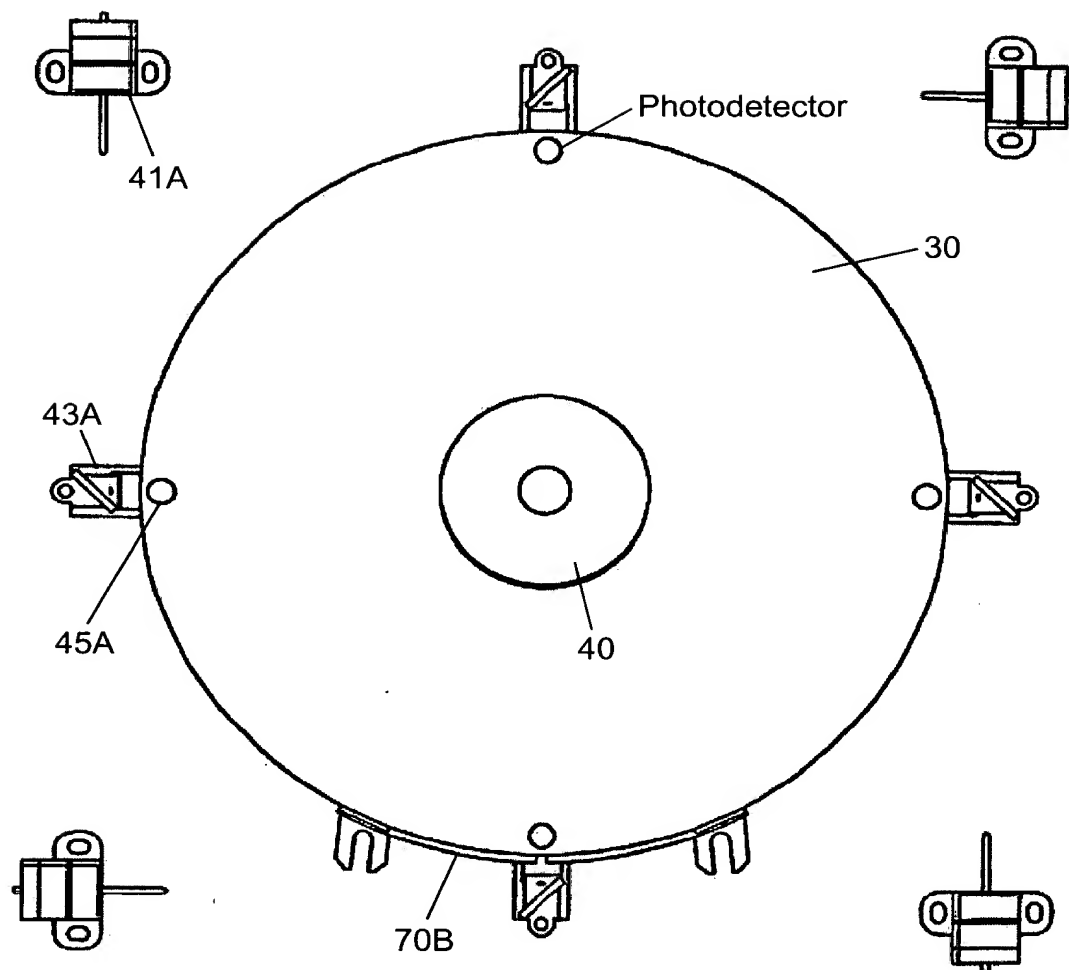
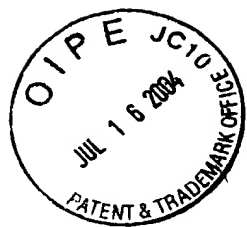


FIG. 2J1

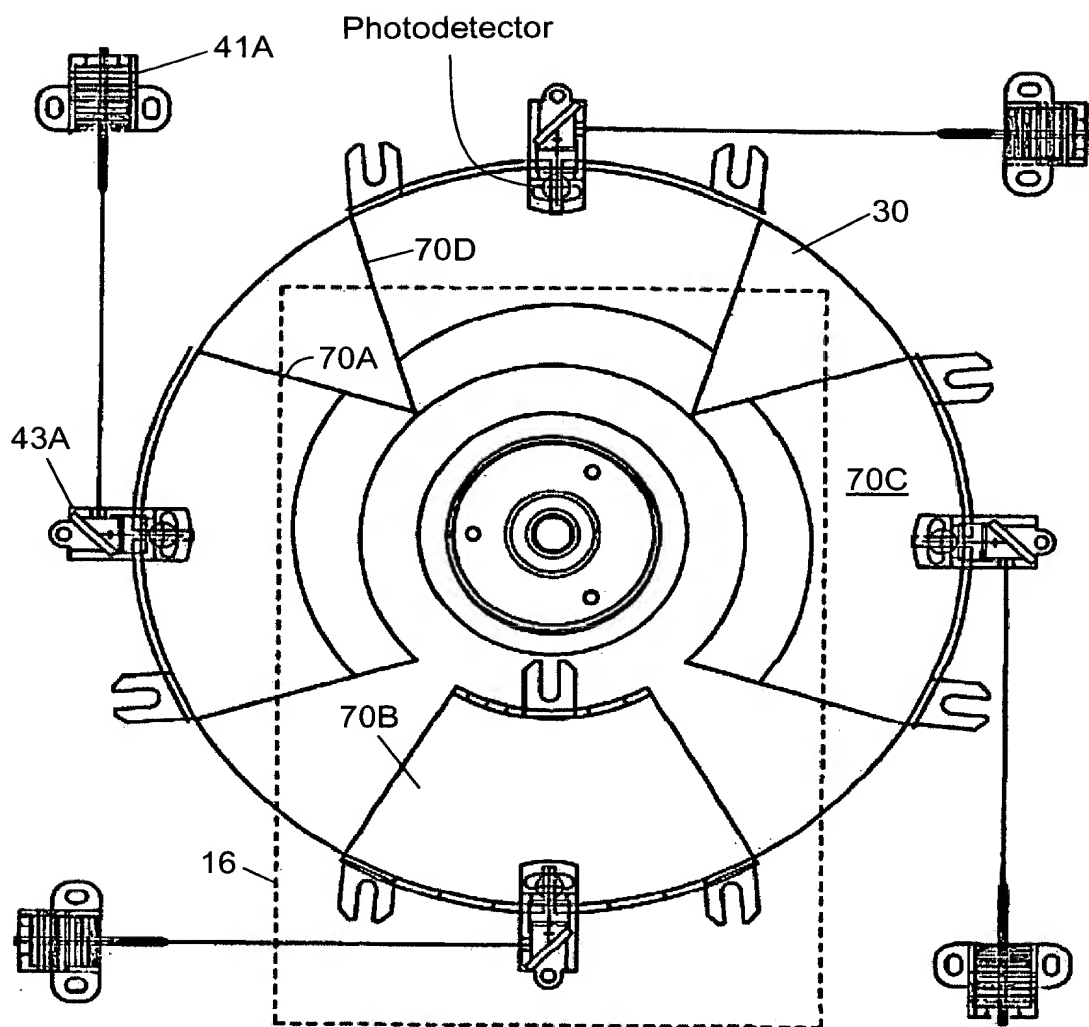


FIG. 2J2

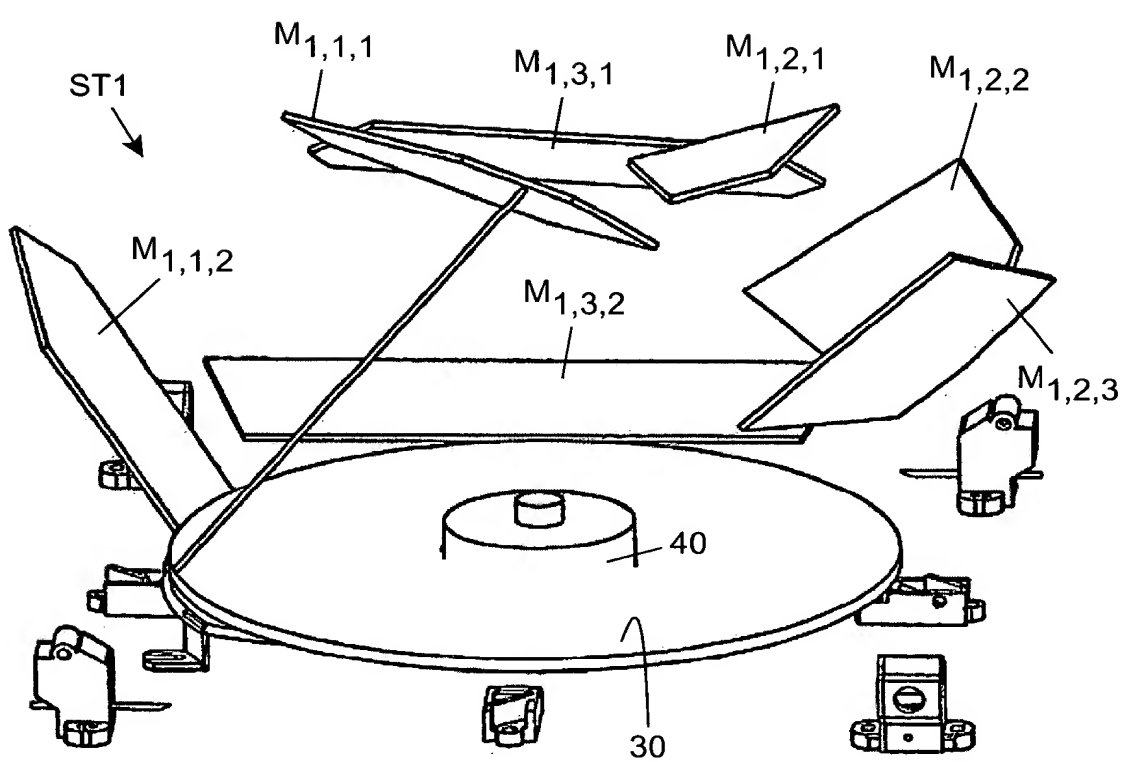


FIG. 2K

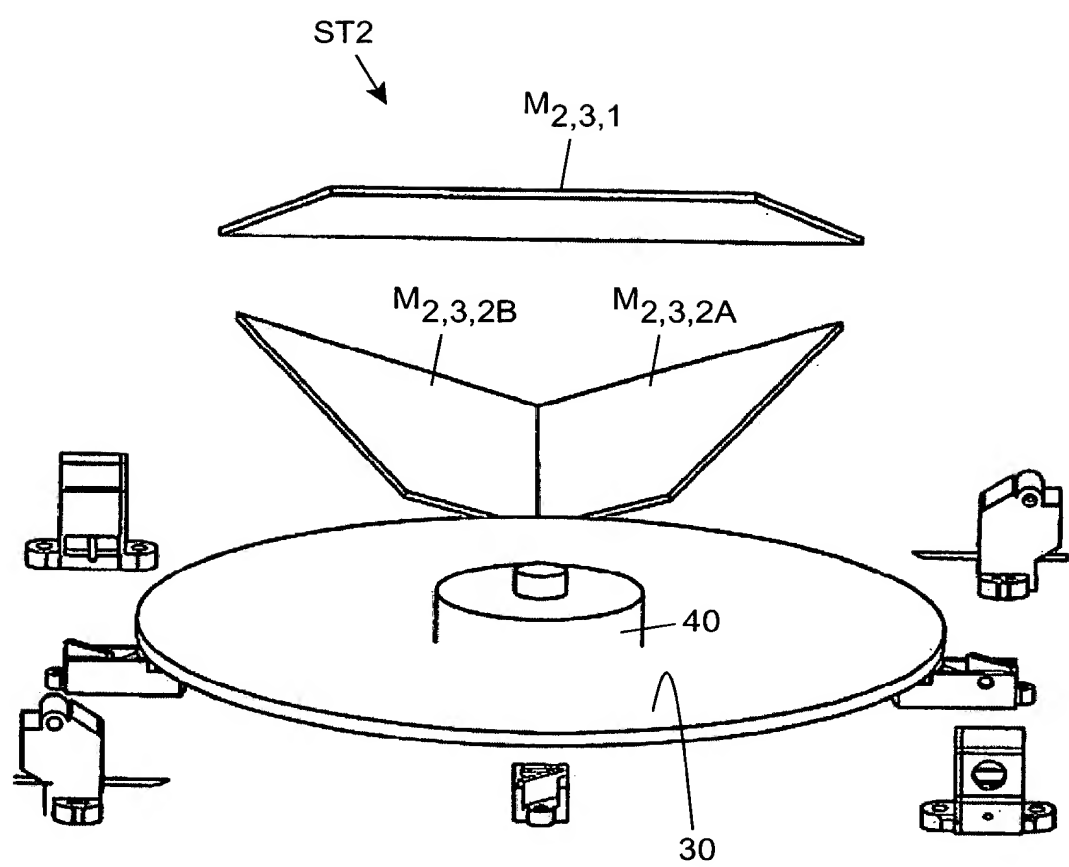


FIG. 2L

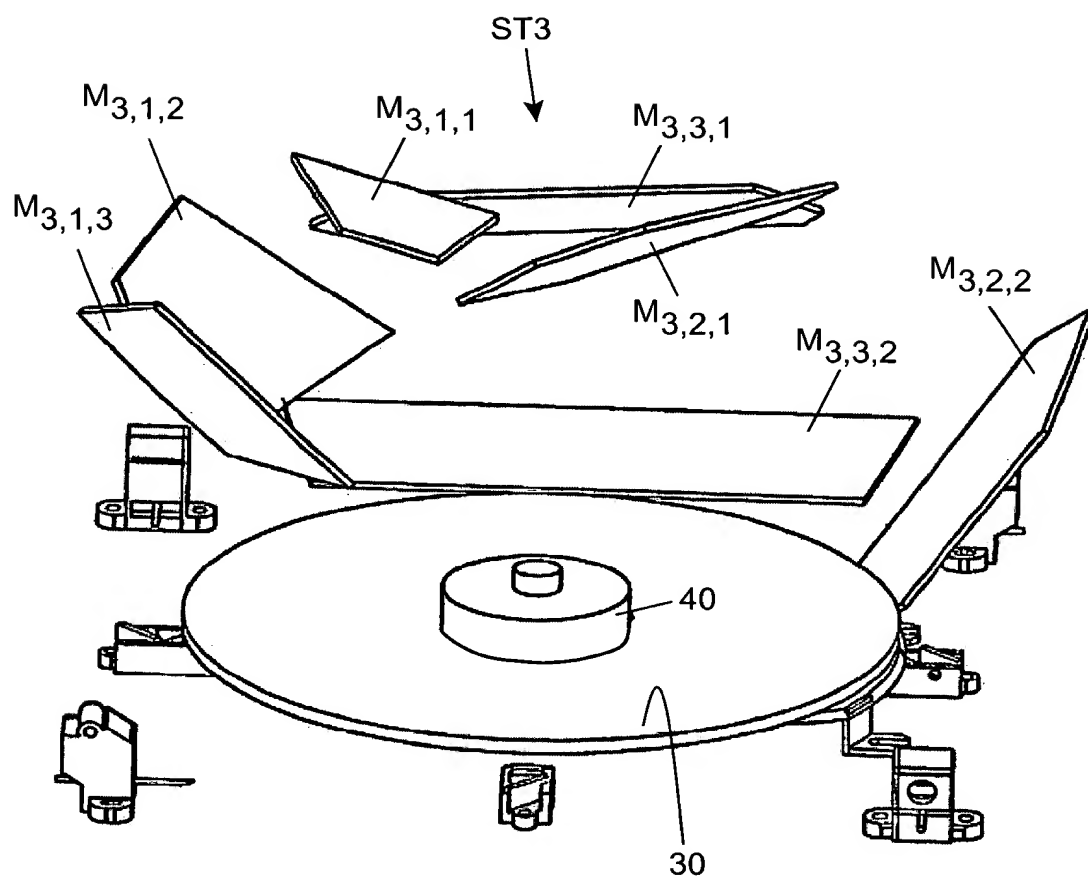


FIG. 2M

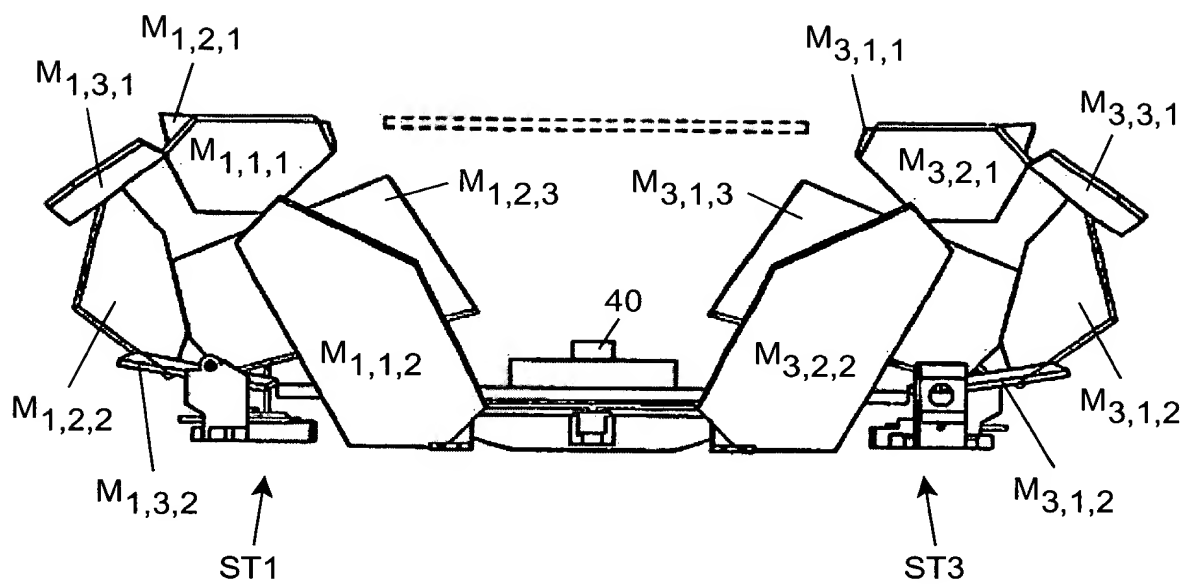


FIG. 2N

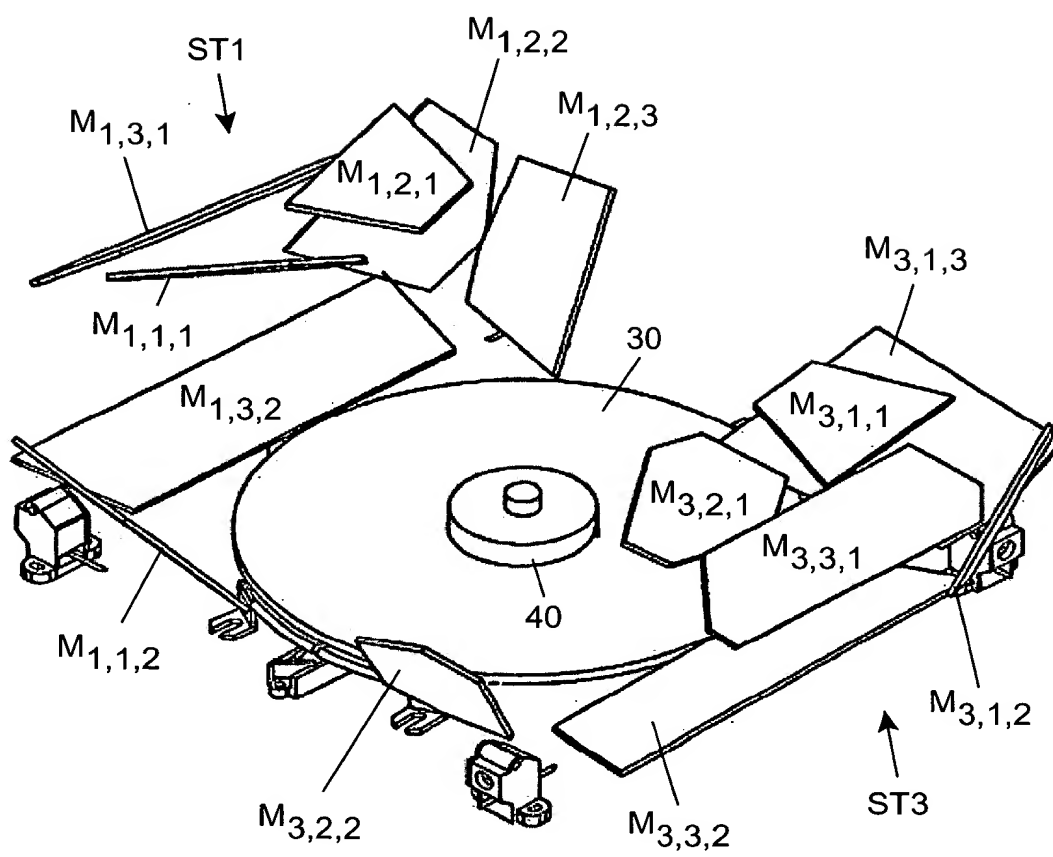


FIG. 20

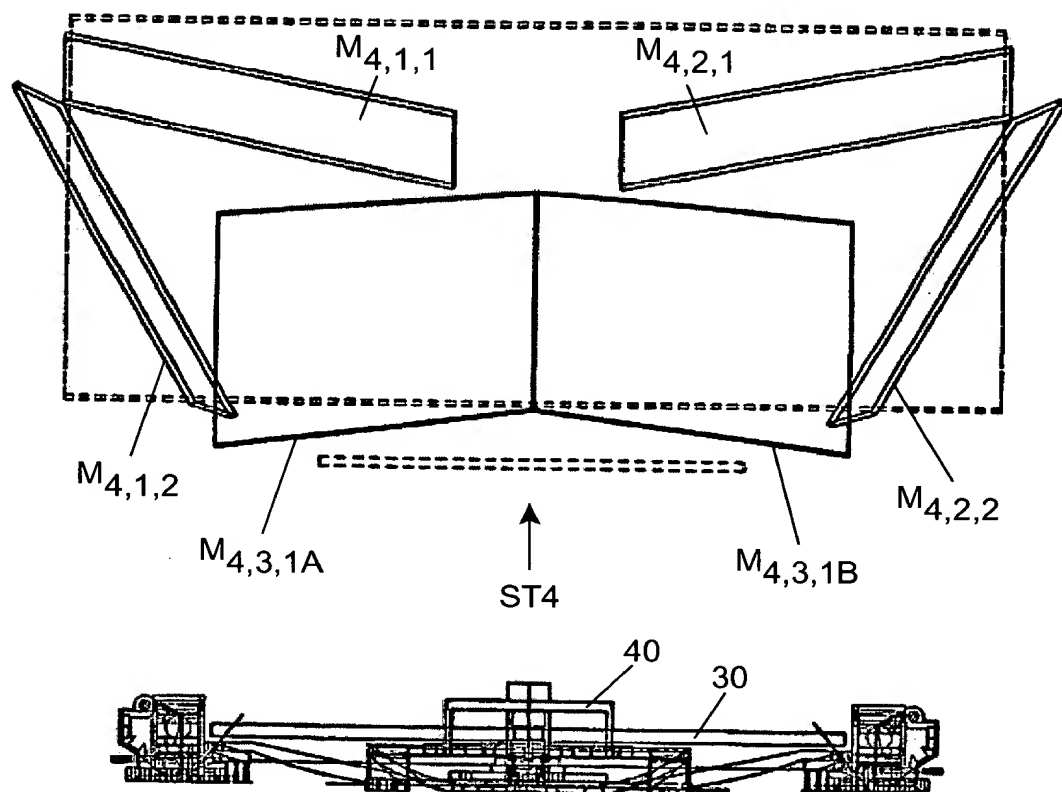


FIG. 2P

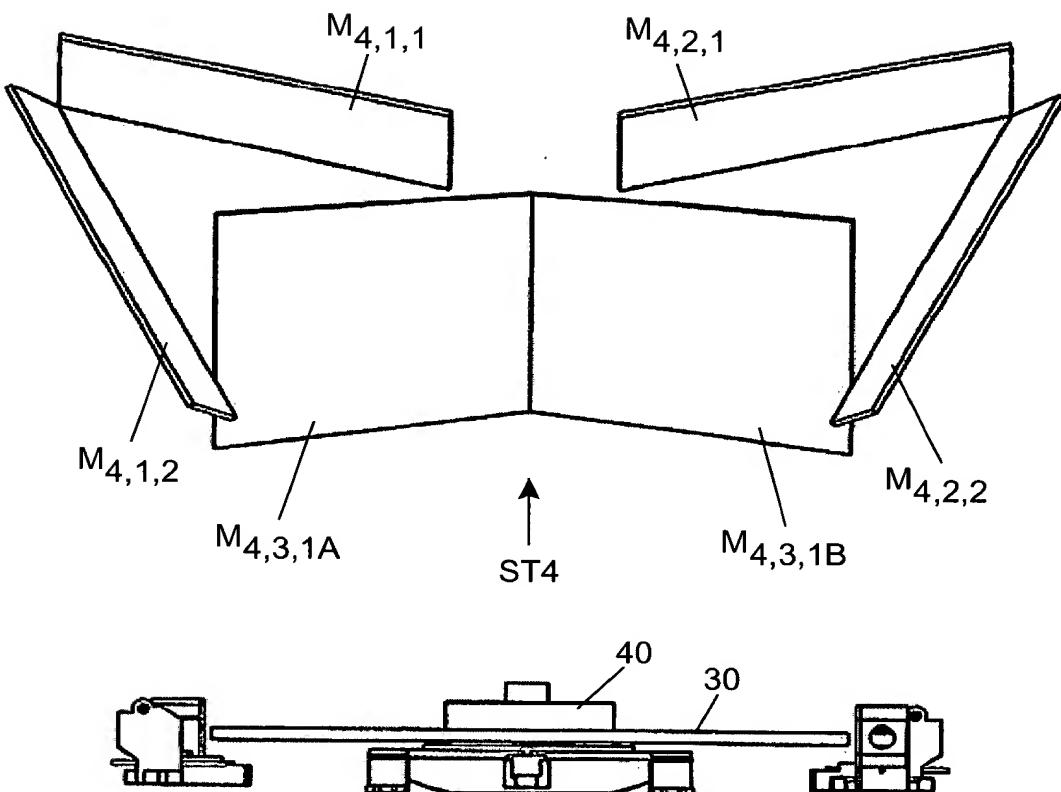
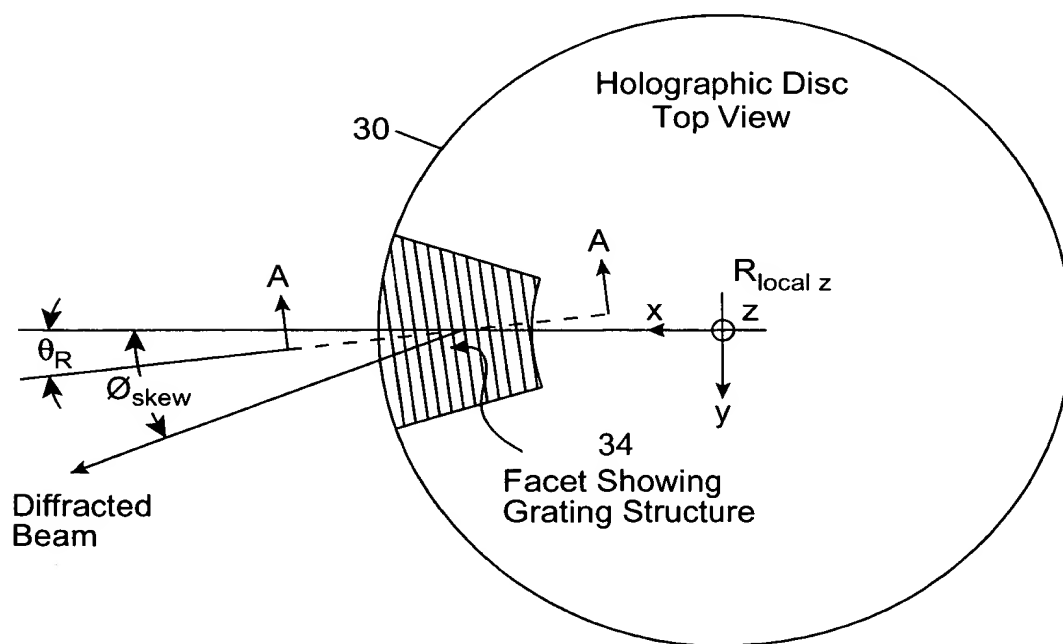
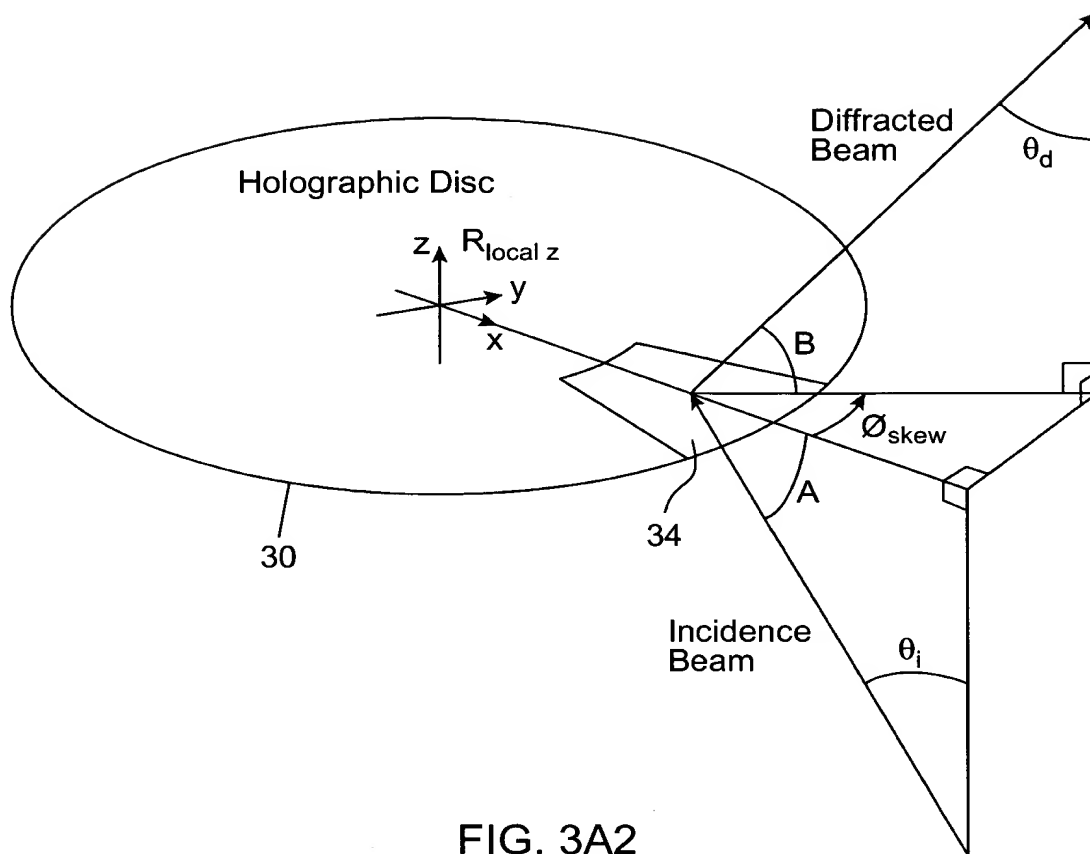
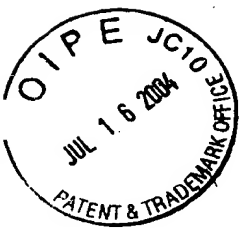


FIG. 2Q

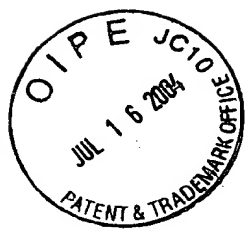




ELEVATION AND SKEW ANGLE CHARACTERISTICS OF FACETS ON
HOLOGRAPHIC SCANNING DISK OF THE PRESENT INVENTION

FACET GROUP NO.	G1	HIGH ELEVATION ANGLE LEFT SKEW ANGLE	FACET NO.
			7
			9
			11
	G2	HIGH ELEVATION ANGLE RIGHT SKEW ANGLE	FACET NO.
			8
			10
			12
	G3	LOW ELEVATION ANGLE NO/ZERO SKEW ANGLE	FACET NO.
			1
			2
			3
			4
			5
			6

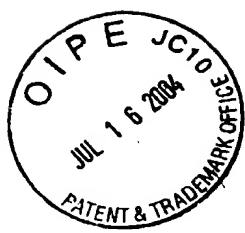
FIG. 3A4



MG2@ST1 MG1@ST1 MG3@ST1

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Station 1	(Local Co-ordinates)														
2		Negative skew (Right)														
3	First Mirror	x	y	z		x	y	z		x	y	z				
4		2.55	-1.80	2.70		3.80	2.30	2.77		4.30	1.60	2.52				
5		4.15	-2.27	2.77		4.10	1.88	2.40		4.95	2.15	2.04				
6	M _{1,2,1}	3.95	0.23	2.05	M _{1,1,1}	3.80	0.14	1.80	M _{1,3,1}	5.20	2.00	1.83				
7		2.42	-0.24	2.25		3.10	-0.80	1.80		5.00	-1.80	1.66				
8		2.55	-1.80	2.70		2.50	-0.16	2.45		4.70	-2.10	1.87				
9						2.65	0.76	2.77		4.10	-1.60	2.40				
10						3.80	2.30	2.77		4.30	1.60	2.52				
11																
12	Second Mirror	x	y	z		x	y	z		x	y	z				
13		4.00	-2.63	0.05		1.70	4.10	1.30		3.10	2.60	-0.03				
14		4.90	-1.40	0.77		3.00	4.45	1.98		4.50	3.00	0.22				
15	M _{1,2,2}	4.60	-3.20	2.18	M _{1,1,2}	3.40	3.99	1.50	M _{1,3,2}	4.35	-2.30	0.30				
16		3.70	-4.10	1.06		2.30	2.43	-0.63		3.00	-2.00	0.04				
17		4.00	-2.63	0.05		1.40	2.57	-0.63		3.10	2.60	-0.03				
18						1.00	2.99	-0.20								
19						1.70	4.10	1.30								
20																
21	Third Mirror	x	y	z												
22		4.41	-4.10	1.10												
23		1.97	-3.30	2.20												
24	M _{1,2,3}	1.12	-1.60	0.80												
25		2.51	-2.00	0.10												
26		3.53	-2.70	0.10												
27		4.41	-4.10	1.10												
28																

FIG. 3B

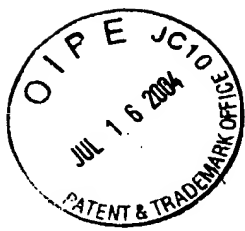


MG3@ST2

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
30																
31	Station 2 (Local Co-ordinates)															
32		Negative skew				Positive Skew				No Skew				No Skew		
33	First Mirror	x	y	z		x	y	z		x	y	z				
34										3.75	-1.60	2.51				
35										5.10	-2.40	1.73				
36									M _{2,3}	5.10	2.40	1.73				
37										3.75	1.60	2.51				
38										3.75	-1.60	2.51				
39																
40																
41																
42	Second Mirror	x	y	z		x	y	z		x	y	z		x	y	z
43										3.00	0.00	-0.11		3.00	0.00	-0.11
44										4.80	0.00	0.38		4.80	0.00	0.38
45										5.07	-2.26	1.07		5.07	2.26	1.07
46									M _{3,3,2A}	5.07	-2.26	1.07		5.07	2.26	1.07
47										3.06	-1.00	0.17		3.06	1.00	0.17
48										3.00	0.00	-0.11		3.00	0.00	-0.11
49																
50										(Split mirror for generating two sets of horizontal lines)						
51																
52																

M_{3,3,2B}

FIG. 3C

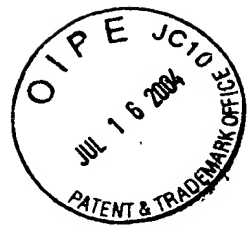


MG2@ST3				MG1@ST3				MG3@ST3				
	A	B	C	D	E	F	G	H	I	J	K	L
54	Station 3	(Local Co-ordinates)										
55		(R)Negative skew				(L)Positive Skew				No Skew		
56	First Mirror	x	y	z		x	y	z		x	y	z
57		3.80	-2.30	2.77		2.55	1.80	2.70		4.30	-1.60	2.52
58		4.10	-1.88	2.40		4.15	2.27	2.77		4.95	-2.15	2.04
59	M _{3,2,1}	3.80	-0.14	1.80	M _{3,1,1}	3.95	-0.23	2.05		5.20	-2.00	1.83
60		3.10	0.80	1.80		2.42	0.24	2.25		5.00	1.80	1.66
61		2.50	0.16	2.45		2.55	1.80	2.70		4.70	2.10	1.87
62		2.65	-0.76	2.77						4.10	1.60	2.40
63		3.80	-2.30	2.77						4.30	-1.60	2.52
64												
65	Second Mirror	x	y	z		x	y	z		x	y	z
66		1.70	-4.10	1.30		4.00	2.63	0.05		3.10	-2.60	-0.03
67		3.00	-4.45	1.98		4.90	1.40	0.77		4.50	-3.00	0.22
68		3.40	-3.99	1.50		4.60	3.20	2.18		4.35	2.30	0.30
69	M _{3,2,2}	2.30	-2.43	-0.63	M _{3,1,2}	3.70	4.10	1.06		3.00	2.00	0.04
70		1.40	-2.57	-0.63		4.00	2.63	0.05		3.10	-2.60	-0.03
71		1.00	-2.99	-0.20								
72		1.70	-4.10	1.30								
73												
74	Third Mirror	x	y	z		x	y	z				
75						4.41	4.10	1.10				
76						1.97	3.30	2.20				
77					M _{3,1,3}	1.12	1.60	0.80				
78						2.51	2.00	0.10				
79						3.53	2.70	0.10				
80						4.41	4.10	1.10				
81												

M_{3,3,1}

M_{3,3,2}

FIG. 3D

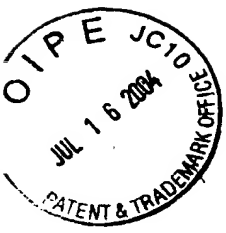


MG2@ST4 MG1@ST4 MG3@ST4

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
83	Station 4 (Local Co-ordinates)															
84	Negative skew															
85	First Mirror	x	y	z		x	y	z		x	y	z		x	y	z
86		4.90	-0.80	6.41		4.90	0.80	6.41		6.70	0.00	5.61		6.70	0.00	5.61
87		6.10	-0.80	5.65		6.10	0.80	5.65		7.40	0.00	3.32		7.40	0.00	3.32
88	M _{4,2,1}	6.00	-4.50	6.47	M _{4,1,1}	6.00	4.50	6.47	M _{4,3,1A}	6.95	-3.00	2.90		6.95	3.00	2.90
89		4.90	-4.50	7.17		4.90	4.50	7.17		6.20	-3.00	5.34		6.20	3.00	5.34
90		4.90	-0.80	6.41		4.90	0.80	6.41		6.70	0.00	5.61		6.70	0.00	5.61
91																
92										(Split mirror for generating two sets of horizontal lines)						
93																
94	Second Mirror	x	y	z		x	y	z		x	y	z				
95		2.85	-3.20	3.37		2.85	3.20	3.37								
96		4.20	-2.80	3.23		4.20	2.80	3.23								
97	M _{4,2,2}	5.95	-4.50	6.46	M _{4,1,2}	5.95	4.50	6.46								
98		4.60	-4.95	6.68		4.60	4.95	6.68								
99		2.85	-3.20	3.37		2.85	3.20	3.37								
100																

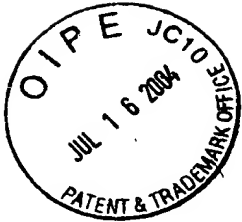
M_{4,3,1B}

FIG. 3E



	A	B	C	D	E	F	G	H	I	J	K
967	***	Table of Major Dependent Parameters for both the Scanner and the Disk ***									
968											
969	Box height (inches):				N/A	(See Note 1)					
970	Box width (inches):				N/A	(See Note 2)					
971	Max angle B (degrees):				62.00	(See Note 3)					
972	Min angle B (degrees):				38.00	(See Note 3)					
973	Total facet angular sweep (degrees):				358.14	(See Note 4)					
974											
975	Min (angle A - angle B) (degrees):				0.00	(See Note 6)					
976	Max beam speed (inches per second):				13704						
977	Min beam speed (inches per second):				7158						
978	Power at data detector (nW):				872						
979	Signal voltage (volts):				5.47	(See Note 7)					
980	Signal voltage at max DOF limits (volts):				3.45	(See Note 7)					
981	CDRH:	P-avg. Class 2?	Class 2A?	P-pulse Class 1?			0.91	Max bandwidth (MHz) for	7.5	mil bars	
982		YES	YES	YES		(See Note 8)					
983											
984	IEC:	Single pulse	P-avg. 0.25s	Pulse train correction							
985		PASS	PASS	PASS		(See Note 8)					
986											
987											

FIG. 3F1



	A	B	C	D	E	F	G	H	I	J	K
988	Note 1: If this entry is highlighted (red) then the value exceeds the specified value for										
989	the box height (Cell G21). Go to cells G417 to G456 to identify the problem entries										
990	and make the necessary inner radius adjustments in Cells G215 to G254.										
991											
992	Note 2: This entry is not used in the box design, but it gives an indication of the box										
993	dimensions that would be established by the width of the tops of the mirrors.										
994											
995	Note 3: Generally, the B angles should range between 40 degrees and 70 degrees.										
996	Holograms with smaller or larger angles may be difficult to construct.										
997											
998	Note 4: This entry must be less than, but within a few degrees of, 360 degrees.										
999	To satisfy this requirement, it may be necessary to make adjustments										
1000	to the focal distances and/or the length of the scan lines.										
1001											
1002											
1003											
1004											
1005											
1006	Note 6: This value must be greater than 0.5 degrees to avoid feedback into the										
1007	laser from disk surface reflections. If it is too small, adjustments must be										
1008	made to the B angles of the problem facets (See Cells X468 to X507).										
1009											
1010	Note 7: The signal voltage must be greater than some value established by the signal										
1011	processor requirements. Typically, this value should be greater than 2 volts.										
1012	If this value is less than 2 volts, either the laser power must be increased or										
1013	the focal distances must be decreased.										
1014											
1015	Note 8: All CDRH/IEC entries must be YES or PASS. If not, laser power must be reduced.										
1016	(Modify laser power in Cell B799.)										

FIG. 3F2

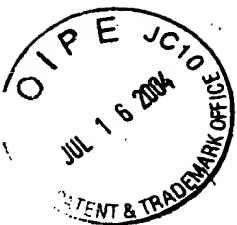


	A	B	C	D	E	F
457						
458	d = distance from disk to base of scanner (inches):					
459						
460	Rotational speed of disk (rpm)					
461						
462	DiskStratos_4.xls					
463						
464		Diffraction	Geometrical			Angle of
465	Facet	Focal length	Focal length	Angle A	Angle B	Diffraction
466		(inches)	(inches)	(degrees)	(degrees)	(degrees)
467		Given		Given	Given	
468	1	12.5	12.68	52	38.00	52.00
469	2	11.5	11.64	52	40.00	50.00
470	3	12.7	12.88	52	42.00	48.00
471	4	11.5	11.64	52	44.00	46.00
472	5	12.7	12.88	52	48.00	42.00
473	6	12.0	12.15	52	52.00	38.00
474	7	14.7	14.99	52	58.00	32.00
475	8	14.7	14.99	52	58.00	32.00
476	9	13.5	13.72	52	60.00	30.00
477	10	13.5	13.72	52	60.00	30.00
478	11	14.8	15.09	52	62.00	28.00
479	12	14.8	15.09	52	62.00	28.00

FIG. 3G1A

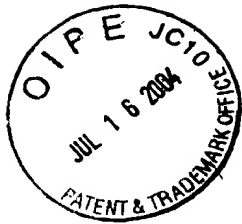
	G	H	I	J	K	L	M
457							
458	0						
459							
460	5200						Maximum Collection Area
461							
462	650 nm				Accounting for dead time for laser beam	Light Collection Factor	
463	Focal plane	359.13			1.23 (degrees)		(ignoring notch)
464	scan line		Scan mult. Factor (m)	Rotation Angle (degrees)			
465	length (inches)	Scan Angle (degrees)					(sq. in.)
466							
467							
468	9.750	42.61	1.62	26.24	27.47	1.00	2.28
469	9.750	45.95	1.62	28.35	29.58	0.80	1.81
470	9.750	42.00	1.58	26.66	27.89	0.92	2.09
471	9.750	45.95	1.57	29.19	30.42	0.71	1.62
472	9.750	42.00	1.50	27.97	29.21	0.79	1.79
473	9.750	44.22	1.46	30.28	31.51	0.64	1.47
474	9.750	36.69	1.31	27.99	29.23	0.87	1.97
475	9.750	36.69	1.31	27.99	29.23	0.87	1.97
476	9.750	39.71	1.30	30.65	31.88	0.71	1.61
477	9.750	39.71	1.30	30.65	31.88	0.71	1.61
478	9.750	36.46	1.25	29.19	30.42	0.83	1.88
479	9.750	36.46	1.25	29.19	30.42	0.83	1.88

FIG. 3G1B



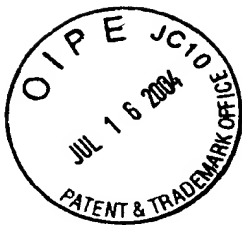
	N	O	P	Q	R	S	T	U
457	Notch size in mirror							
458	TG (12/21/99)							
459	3.5 mm x 5.1 m (3.5 mm x 6.5 mm at disk)							
460	Design							
461	Collection							
462	Area	Beam speed at center of scan line	Beam speed at max depth of field	Beam speed at min depth of field	Beam skew angle	Facet count function		
463	(Includes					1 = facet	Number of facets	
464	notch loss of					0 = no facet		
465	0.035							
466	sq. inches)	(inches/sec)	(inches/sec)	(inches/sec)	(degrees)			
467						Max freq.	Min Freq.	
468	2.27	11052	13704	8400	0	1	0.914	0.560
469	1.81	10150	12798	7502	0	1	0.853	0.500
470	2.08	10895	13468	8321	0	1	0.898	0.555
471	1.63	9858	12429	7286	0	1	0.829	0.486
472	1.79	10383	12835	7930	0	1	0.856	0.529
473	1.47	9544	11929	7158	0	1	0.795	0.477
474	1.97	10492	12634	8351	28	1	0.842	0.557
475	1.97	10492	12634	8351	-28	1	0.842	0.557
476	1.62	9524	11640	7407	28	1	0.776	0.494
477	1.62	9524	11640	7407	-28	1	0.776	0.494
478	1.88	10068	12108	8027	28	1	0.807	0.535
479	1.88	10068	12108	8027	-28	1	0.807	0.535

FIG. 3G2A



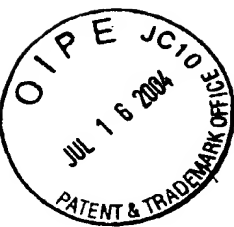
	V	W	X	Y	Z	AA	AB
457							
458							
459	NOTE: if any entry in these two columns is less than 0.5 degrees						
460	(highlighted in red), the corresponding B angle should be changed.						
461	This is accomplished by modifying the "Distance from rotational axis"						
462	entry for that line (cells G46 to G85).						
463							
464			Angle A - Angle B				
465			(Absolute value)				
466			(degrees)				
467	Bandwidth						
468	0.354		14.00				
469	0.353		12.00				
470	0.343		10.00				
471	0.343		8.00				
472	0.327		4.00				
473	0.318		0.00				
474	0.286		6.00				
475	0.286		6.00				
476	0.282		8.00				
477	0.282		8.00				
478	0.272		10.00				
479	0.272		10.00				

FIG. 3G2B



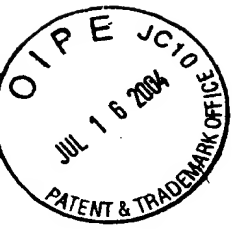
	A	B	C	D	E
508	Avg. f.l. (in.)	13.46	Average angle B (degrees):		52.00
509	Avg waist loc	13.24	Maximum angle B (degrees):		62.00
510	Approximate minimum box width:		N/A		inches
511	(Based on large mirror as limitation)				
512					
513					
514					
515	*** Master Hologram Exposure Information ***				
516	DiskStratos_4.xls				
517	Gelatin Refractive Indexes				
518	Before processing:		1.53	Wavelengths (microns)	0.65
519	After processing:		1.4	Scanner:	0.488
520				Exposure:	
521	Facet				
522	Grating spacing at scan region (microns)				
523		Design wavelength =		0.65	microns
524	1		0.4631		
525	2		0.4704		
526	3		0.4784		
527	4		0.4869		
528	5		0.5059		
529	6		0.5279		
530	7		0.5674		
531	8		0.5674		
532	9		0.5826		
533	10		0.5826		
534	11		0.5990		
535	12		0.5990		

FIG. 3H1



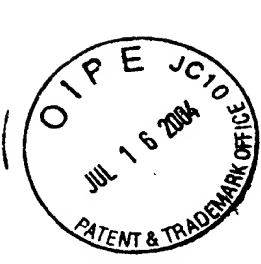
	F	G	H	I	J	K	L
508			Average:	1.42			
509		SUMS ---->	488.46		344.36	359.13	9.65
510							
511		Total facet angular sweep (degrees):				359.13	
512							
513							
514							
515							
516		650 nm					
517							
518		Distance from beam incidence point on disk to 488 nm reference point:					
519		Diffraction	Diffraction		Exposure angles at reference point at 488 nm		
520		angle from	angle from		Reference	Object	
521	Facet	annulus	reference point		Beam	Beam	
522		(degrees)	(degrees)		(degrees)	(degrees)	
523							
524	1	52.00	52.00		25.13	38.99	
525	2	50.00	50.00		25.45	37.42	
526	3	48.00	48.00		25.78	35.82	
527	4	46.00	46.00		26.12	34.20	
528	5	42.00	42.00		26.81	30.90	
529	6	38.00	38.00		27.53	27.53	
530	7	32.00	32.00		28.64	22.38	
531	8	32.00	32.00		28.64	22.38	
532	9	30.00	30.00		29.02	20.64	
533	10	30.00	30.00		29.02	20.64	
534	11	28.00	28.00		29.40	18.89	
535	12	28.00	28.00		29.40	18.89	

FIG. 3H2



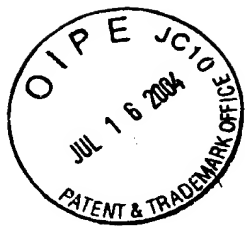
	M	N	O	P	Q	R	S	T	U	V
508										
509	21.99	21.99		<-----SUMS						
510		Vmax (in/s):	13704							
511		Vmin (in/s):	7158							
512		Ratio	1.91							
513										
514										
515										
516										
517										
518		0 inch								
519										
520										
521			alpha-1	beta-1	phi	theta-1	L	theta-2	alpha-2	beta-2
522			(degrees)	(degrees)	(degrees)	(degrees)	(microns)	(degrees)	(degrees)	(degrees)
523										
524			26.09	34.25	85.92	30.17	0.46	20.20	16.12	24.28
525			26.09	33.17	86.46	29.63	0.47	19.86	16.31	23.40
526			26.09	32.06	87.01	29.07	0.48	19.50	16.52	22.49
527			26.09	30.92	87.59	28.50	0.49	19.14	16.72	21.55
528			26.09	28.55	88.77	27.32	0.51	18.38	17.15	19.61
529			26.09	26.09	90.00	26.09	0.53	17.58	17.58	17.58
530			26.09	22.24	91.92	24.17	0.57	16.33	18.26	14.41
531			26.09	22.24	91.92	24.17	0.57	16.33	18.26	14.41
532			26.09	20.92	92.58	23.51	0.58	15.90	18.48	13.32
533			26.09	20.92	92.58	23.51	0.58	15.90	18.48	13.32
534			26.09	19.59	93.25	22.84	0.60	15.47	18.71	12.22
535			26.09	19.59	93.25	22.84	0.60	15.47	18.71	12.22

FIG. 3H3



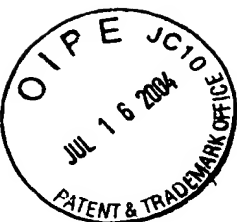
	A	B	C	D	E	F	G	H
566	***	Modified Exposure Angles to Correct for Post-processing Residual Gelatin Swell ***						
567	DiskStratos 4.xls						650 nm	
568	Percent gelatin swell (from measurements) delta-t/t:				20%			
569								
570		Exposure angles at 488 nm			Exposure angles to compensate for swell			
571		Reference	Object		Reference	Object		gamma(sw)
572	Facet	Beam	Beam		Beam	Beam		
573		(degrees)	(degrees)		(degrees)	(degrees)		
574								
575	1	25.13	38.99		23.85	40.50		-4.08
576	2	25.45	37.42		24.34	38.70		-3.54
577	3	25.78	35.82		24.83	36.88		-2.99
578	4	26.12	34.20		25.35	35.04		-2.41
579	5	26.81	30.90		26.41	31.31		-1.23
580	6	27.53	27.53		27.53	27.53		0.00
581	7	28.64	22.38		29.28	21.77		1.92
582	8	28.64	22.38		29.28	21.77		1.92
583	9	29.02	20.64		29.89	19.83		2.58
584	10	29.02	20.64		29.89	19.83		2.58
585	11	29.40	18.89		30.50	17.89		3.25
586	12	29.40	18.89		30.50	17.89		3.25

FIG. 311



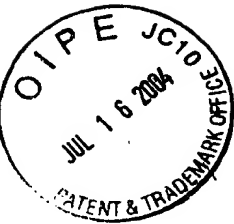
	I	J	K	L	M	N	O
566							
567							
568							
569							
570							
571	gamma(0)	A	B	C	Z	alpha-0	beta-0
572							
573							
574							
575	-4.90	1.99	0.17	0.69	0.26	15.33	25.12
576	-4.25	1.99	0.15	0.68	0.27	15.62	24.12
577	-3.58	1.99	0.12	0.67	0.27	15.93	23.10
578	-2.90	1.99	0.10	0.66	0.28	16.25	22.04
579	-1.48	2.00	0.05	0.63	0.29	16.90	19.86
580	0.00	2.00	0.00	0.60	0.30	17.58	17.58
581	2.31	2.00	-0.08	0.56	0.32	18.65	14.03
582	2.31	2.00	-0.08	0.56	0.32	18.65	14.03
583	3.10	1.99	-0.11	0.55	0.33	19.01	12.81
584	3.10	1.99	-0.11	0.55	0.33	19.01	12.81
585	3.90	1.99	-0.14	0.53	0.33	19.37	11.58
586	3.90	1.99	-0.14	0.53	0.33	19.37	11.58

FIG. 312



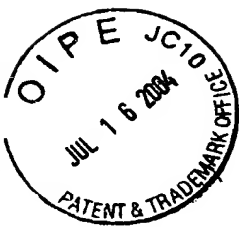
	A	B	C	D	E	F	G	H
617	*** Analysis of the Focus Shift and Out-of-focus Spot Size for Converging Reference Beam ***							
618	(Not applicable for Stratos)							
619	Convergence of the reference beam:							
620	Focal length of parabolic mirror:							
621	Distance from parabolic mirror to detector:							
622	Design	Par. Mirror	Required	Object	Image	Spot size		
623	Focal length	Eff. width	foc. length	distance	distance	at detector		
624	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		
625								
626								
627	1	317.50	40 404.42	-14858.75	59.05	-0.95	0.64	
628	2	292.10	40 364.09	31841.43	58.71	-1.29	0.88	
629	3	322.58	40 412.69	-11828.19	59.11	-0.89	0.60	
630	4	292.10	40 364.09	31841.43	58.71	-1.29	0.88	
631	5	322.58	40 412.69	-11828.19	59.11	-0.89	0.60	
632	6	304.80	40 384.03	-48230.76	58.89	-1.11	0.75	
633	7	373.38	40 499.67	-4485.04	59.60	-0.40	0.27	
634	8	373.38	40 499.67	-4485.04	59.60	-0.40	0.27	
635	9	342.90	40 446.55	-6818.26	59.33	-0.67	0.45	
636	10	342.90	40 446.55	-6818.26	59.33	-0.67	0.45	
637	11	375.92	40 504.23	-4375.15	59.62	-0.38	0.25	
638	12	375.92	40 504.23	-4375.15	59.62	-0.38	0.25	

FIG. 3J1



	I	J	K	L	M
617					
618					
619					
620					
621					
622					
623					
624					
625	0.88				
626					
627	Distance (Cell E621) may have to be adjusted				
628	so that the maximum spot size at the detector is				
629	approximately the same when the 1/2 depth of field value				
630	is negative as it is when the 1/2 depth of field value is positive.				
631	(The 1/2 depth of field value is located at Cell G19)				
632					
633					
634					
635					
636					
637					
638					

FIG. 3J2

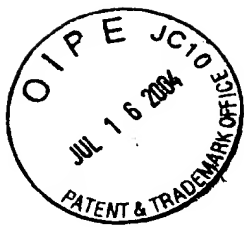


Focal distances and distances to the window for the Stratos scanner
LDD 12/7/99 RPH

Facet	Diffraction Focal length (inches) Given	Distance to		Distance to		Operator side	
		horizontal window (inches)	Difference (inches)	vertical window (inches)	Difference (inches)	horizontal window (inches)	Difference (inches)
1	12.5	8.5	4	10.2	2.3	8	4.5
2	11.5	8.8	2.7	10.2	1.3	8.42	3.08
3	12.7	9.2	3.5	10.2	2.5	8.85	3.85
4	11.5	9.5	2	10.2	1.3	9.25	2.25
5	12.7	9.8	2.9	10.2	2.5	9.7	3
6	12	10.2	1.8	10.2	1.8	10.1	1.9
7	14.7	10.6	4.1	14.1	0.6		
8	14.7	9.7	5	14.1	0.6		
9	13.5	11.2	2.3	13.8	-0.3		
10	13.5	9.8	3.7	13.8	-0.3		
11	14.8	11.1	3.7	13.6	1.2		
12	14.8	9.6	5.2	13.6	1.2		

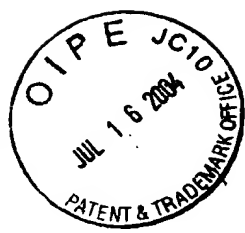
The horizontal window lines from the even numbered vertical facets 8, 10, 12 are near the vertical window.

FIG. 3K



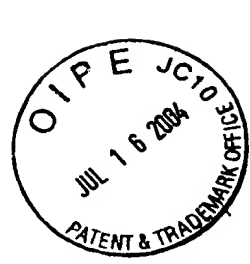
	A	B	C	D	E	F	G	H	I
1	*** CDRH/IEC Calculations to Verify that the Scanner Meets the Laser Class Requirements ***								
2									
3	The number of overlapping lines (N-overlap) must be determined from the scanner data.								
4	A safe assumption for our scanners is to consider that two scan lines are overlapped								
5	ONLY when the difference between their diffraction angles (B) is less than 2 degrees.								
6	All else being equal, the slowest scan lines (largest angle B) will be the worst case scan lines.								
7									
8	N-overlap:	1							
9	Motor speed (rpm):			5200					
10	Alpha-min (radians):			0.0015 (from standard)					
11	FWHM P-divergence of laser (deg.):			8 (Linked from Trnc spreadsheet)					
12	FWHM S-divergence of laser (deg.):			30 (Linked from Trnc spreadsheet)					
13	Focal length of collimating lens (mm):			6.1 (Linked from Trnc spreadsheet)					
14	Angle of incidence at MF plate (deg.):			29.23					
15	Angle of diffraction at MF plate (deg.):			42.12					
16	X-p (mm):			0.87					
17	X-s (mm):			3.93					
18	Average source dimension (mm):			2.40					
19	Distance to aperture (mm):			200 (actual distance or 200 mm, whichever is greater)					
20	Alpha (radians):			0.012					
21	C6:			7.996					
22									

FIG. 3L1A



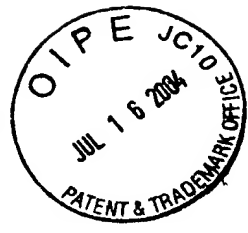
	A	B	C	D	E	F	G	H	I
23									
24		Laser power	tc (200)	ti (actual)					
25		at window	7 mm transit	7 mm transit	P x ti				
26	Facet	(mW)	time at	time at	(Joules)				
27			d = 200 mm	actual d					
28			(seconds)	(seconds)			Facet count		
29									
30	1	0.86	3.95856E-05	3.95856E-05	0.0000339		1		
31	2	0.86	3.96549E-05	3.96549E-05	0.0000341		1		
32	3	0.86	4.08001E-05	4.08001E-05	0.0000351		1		
33	4	0.86	4.08315E-05	4.08315E-05	0.0000352		1		
34	5	0.86	4.28115E-05	4.28115E-05	0.0000370		1		
35	6	0.87	4.40086E-05	4.40086E-05	0.0000381		1		
36	7	0.87	4.90358E-05	4.90358E-05	0.0000425		1		
37	8	0.87	4.90358E-05	4.90358E-05	0.0000425		1		
38	9	0.87	4.96126E-05	4.96126E-05	0.0000430		1		
39	10	0.87	4.96126E-05	4.96126E-05	0.0000430		1		
40	11	0.87	5.14525E-05	5.14525E-05	0.0000446		1		
41	12	0.87	5.14525E-05	5.14525E-05	0.0000446		1		

FIG. 3L1B



	A	B	C	D	E	F	G	H
912	Sums:			0.0000515	0.0000446	These values are the sums of the		
913						worst case (largest) overlap values		
914	Duty Cycle:	0.004459213						
915								
916	Paverage is the sum of the overlap Pi x ti products divided by the sum of the ti times times the duty cycle							
917	Paverage is, therefore, the sum of the overlap Pi x ti products times the rps of the motor.							
918								
919	CDRH calculations and results							
920				Class 1	Class 2?	Class 2A?		
921								
922	Pavg. (mW):		0.003869		YES	YES		
923								
924	P (single pulse) (mW):		8.27					
925	(Maximum allowed)							
926								
927	P (single pulse)		0.87	YES				
928	(Actual)							
929								
930	IEC calculations and results							
931								
932	IEC condition A (Single pulse)							
933						PASS/FAIL		
934	P (single pulse) (mW):		70.6			PASS		
935	(Maximum allowed)							
936								

FIG. 3L2A



	A	B	C	D	E	F	G	H
937								
938	IEC condition B (average power in a 0.25 second pulse train)							
939								
940	Pavg. allowed (mW):		7.92			PASS/FAIL		
941								
942	Pavg. scanner (mW):		0.0039			PASS		
943								
944								
945	IEC condition C (pulse train correction factor)							
946	(For this calculation, you need to insert the sum of the pulse times in the overlapping scan lines)							
947								
948								
949	T-total (seconds):		0.000051					
950	(sum of pulse times							
951	in overlap scan lines)							
952								
953	Pmax (mW):		66.1					
954								
955	Number of pulses in train:		21.67					
956								
957	Correction factor:		0.4635					
958								
959	Pmax (PT corrected)(mW):		30.63			PASS/FAIL		
960								
961	Pw (including overlap)		0.87			PASS		
962								

FIG. 3L2B

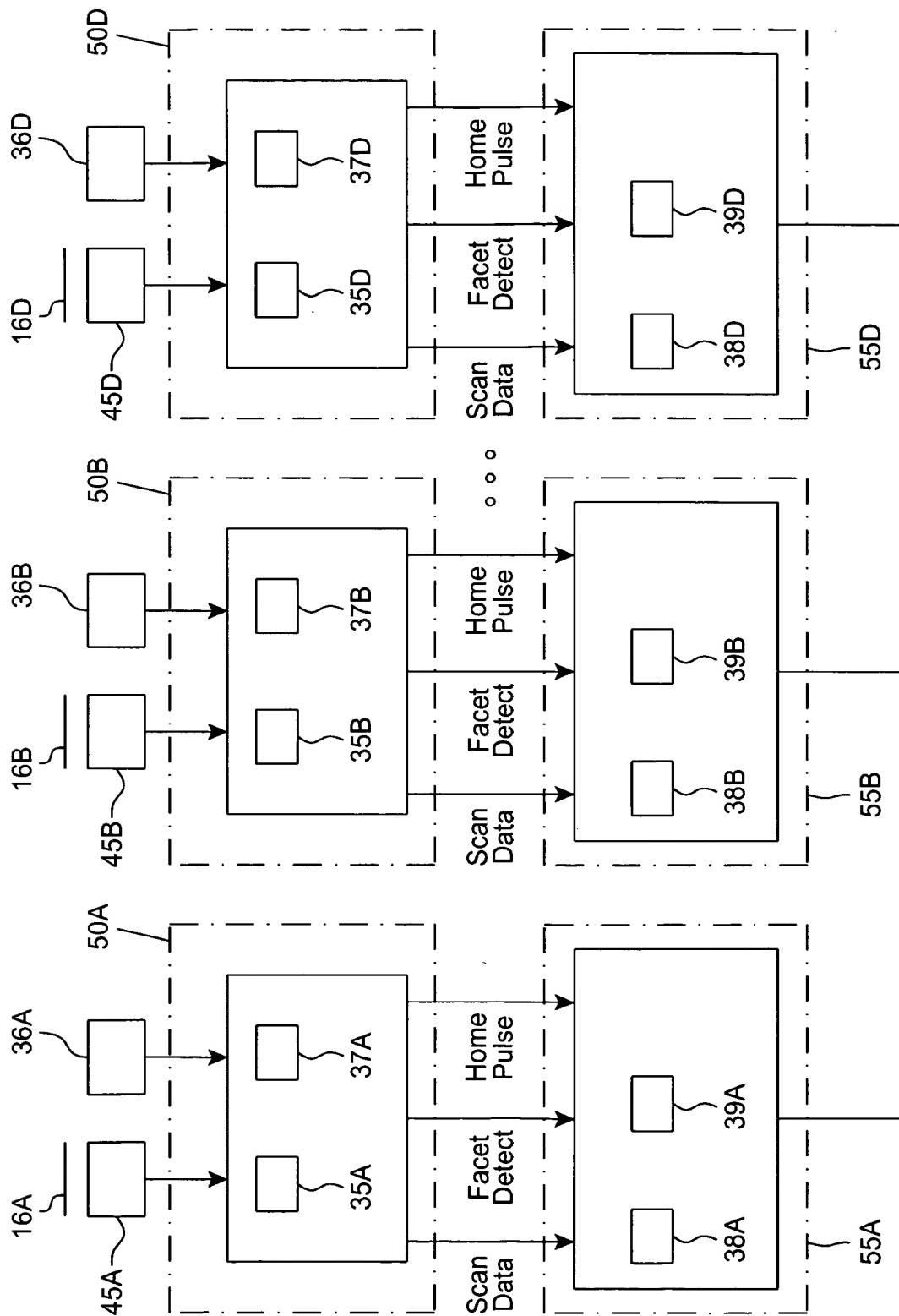


FIG. 4A

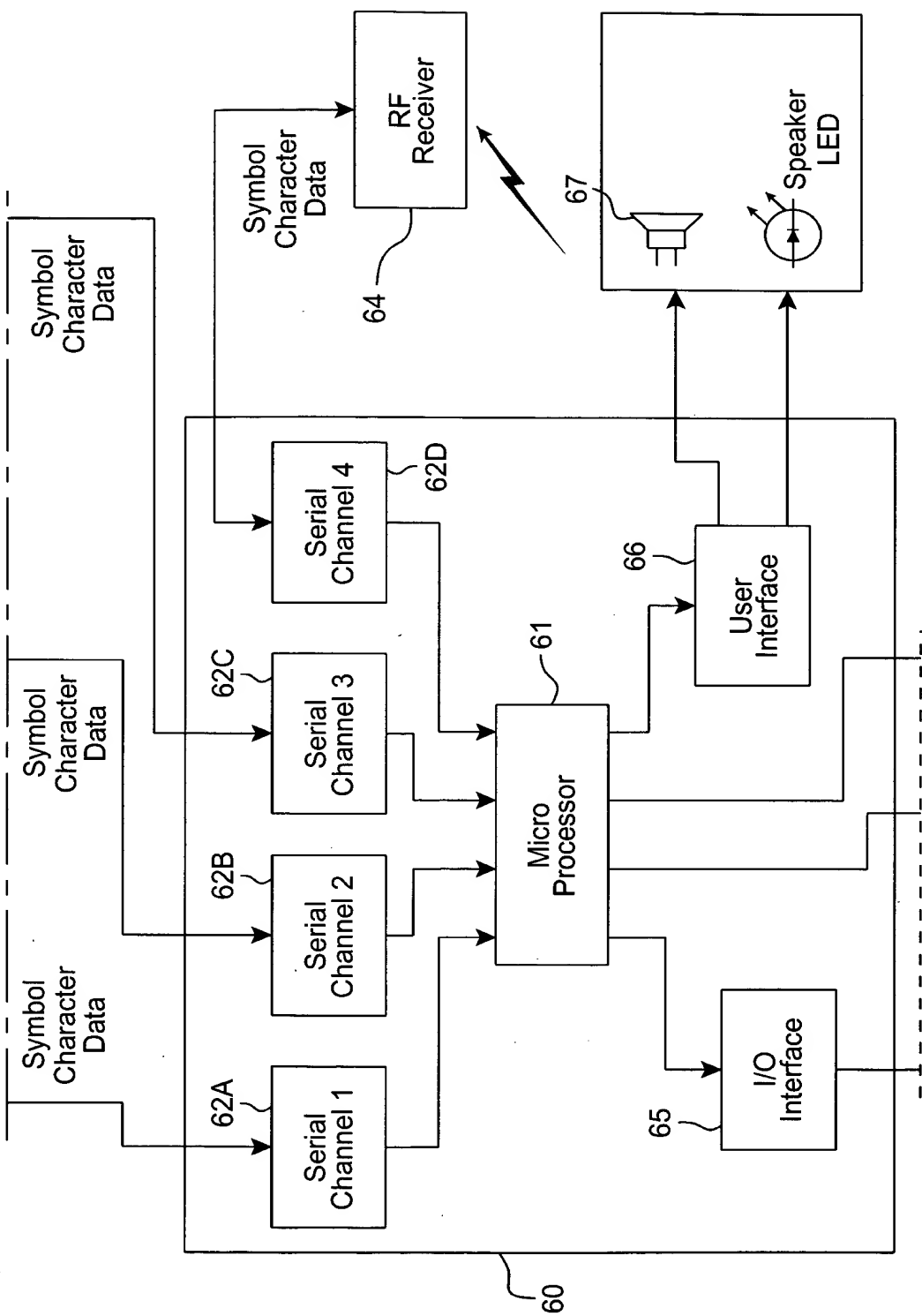
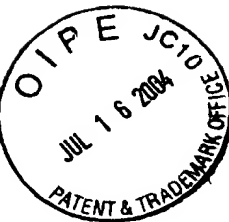


FIG. 4B

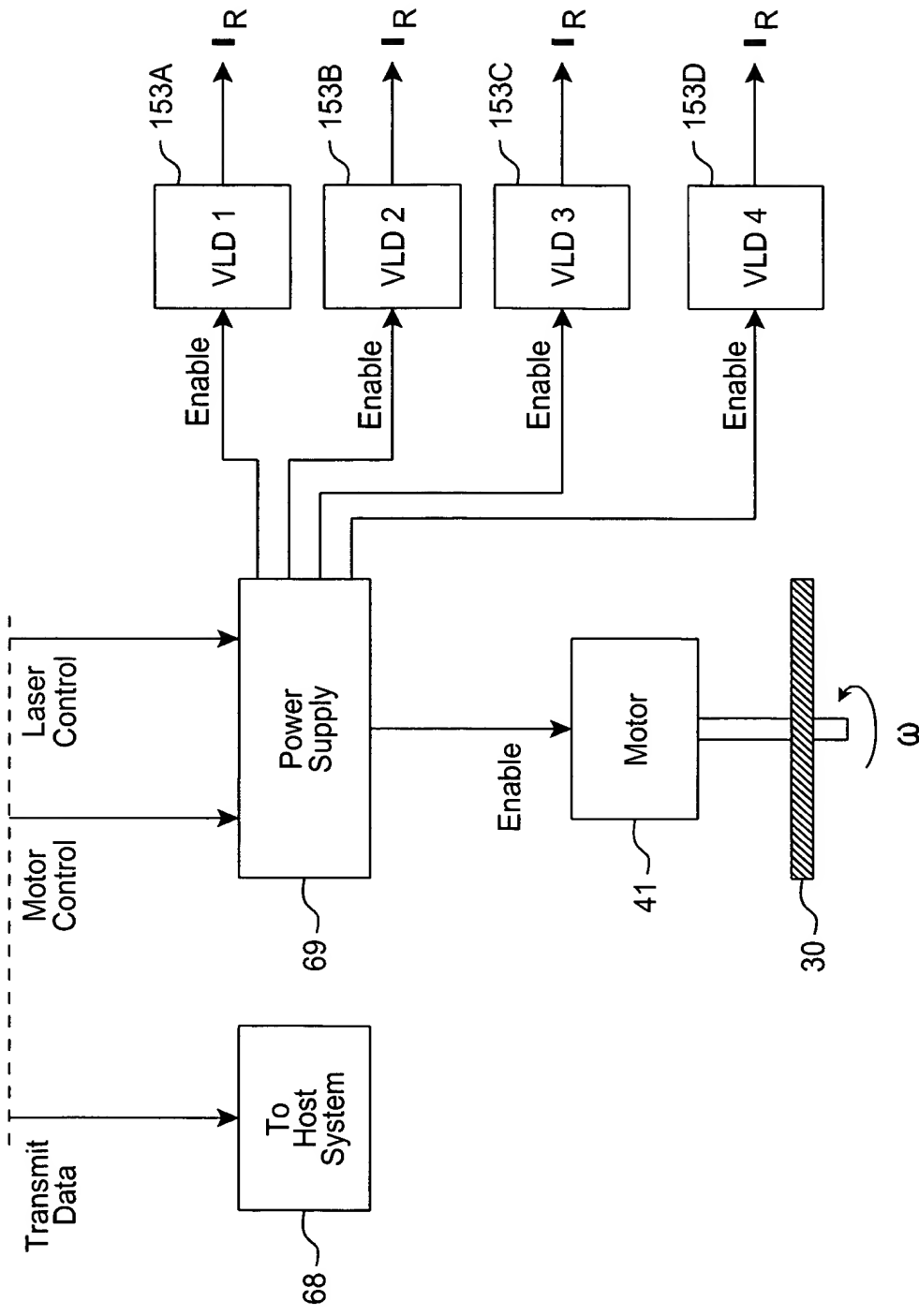


FIG. 4C

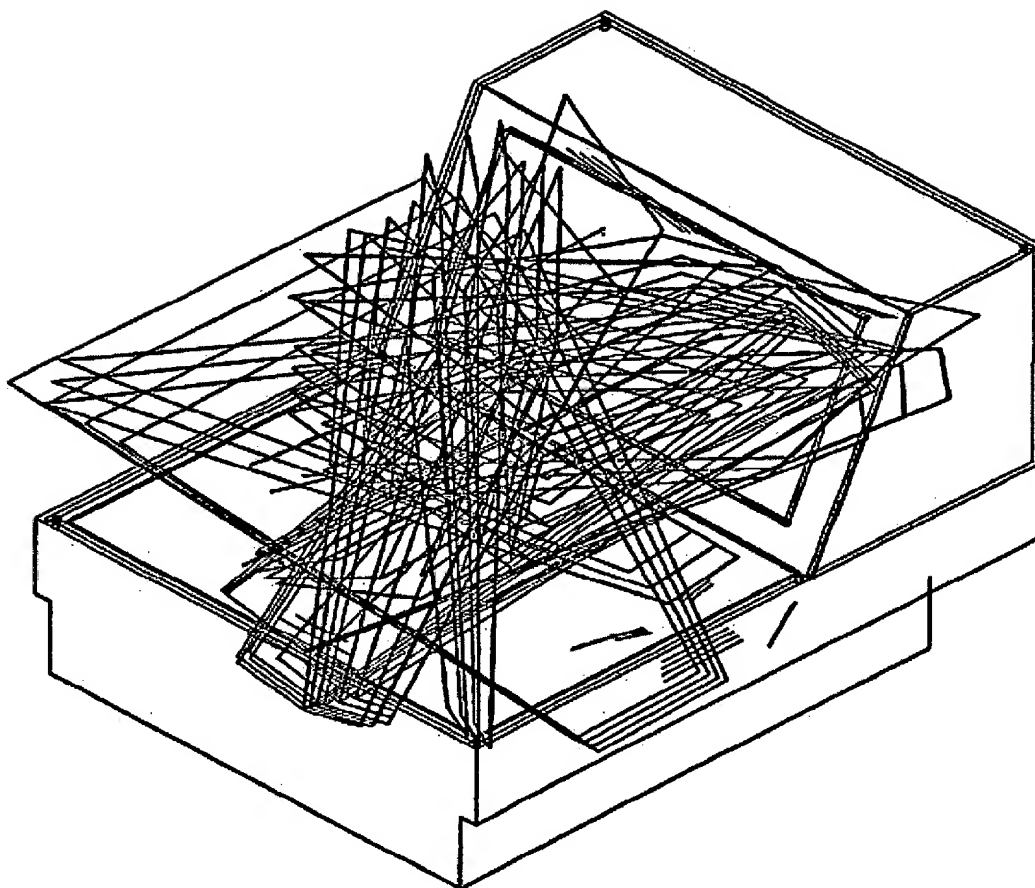
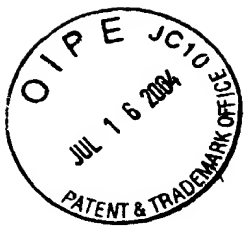


FIG. 5A1

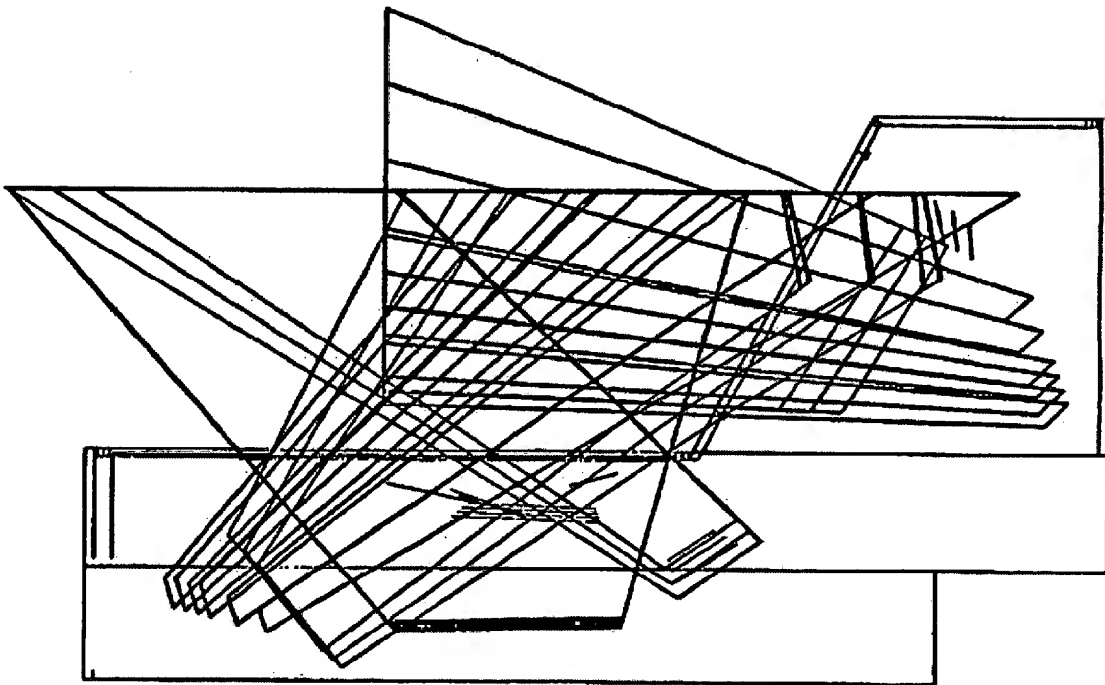
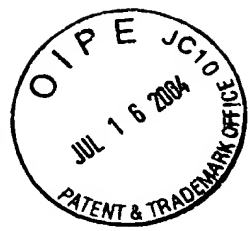


FIG. 5A2

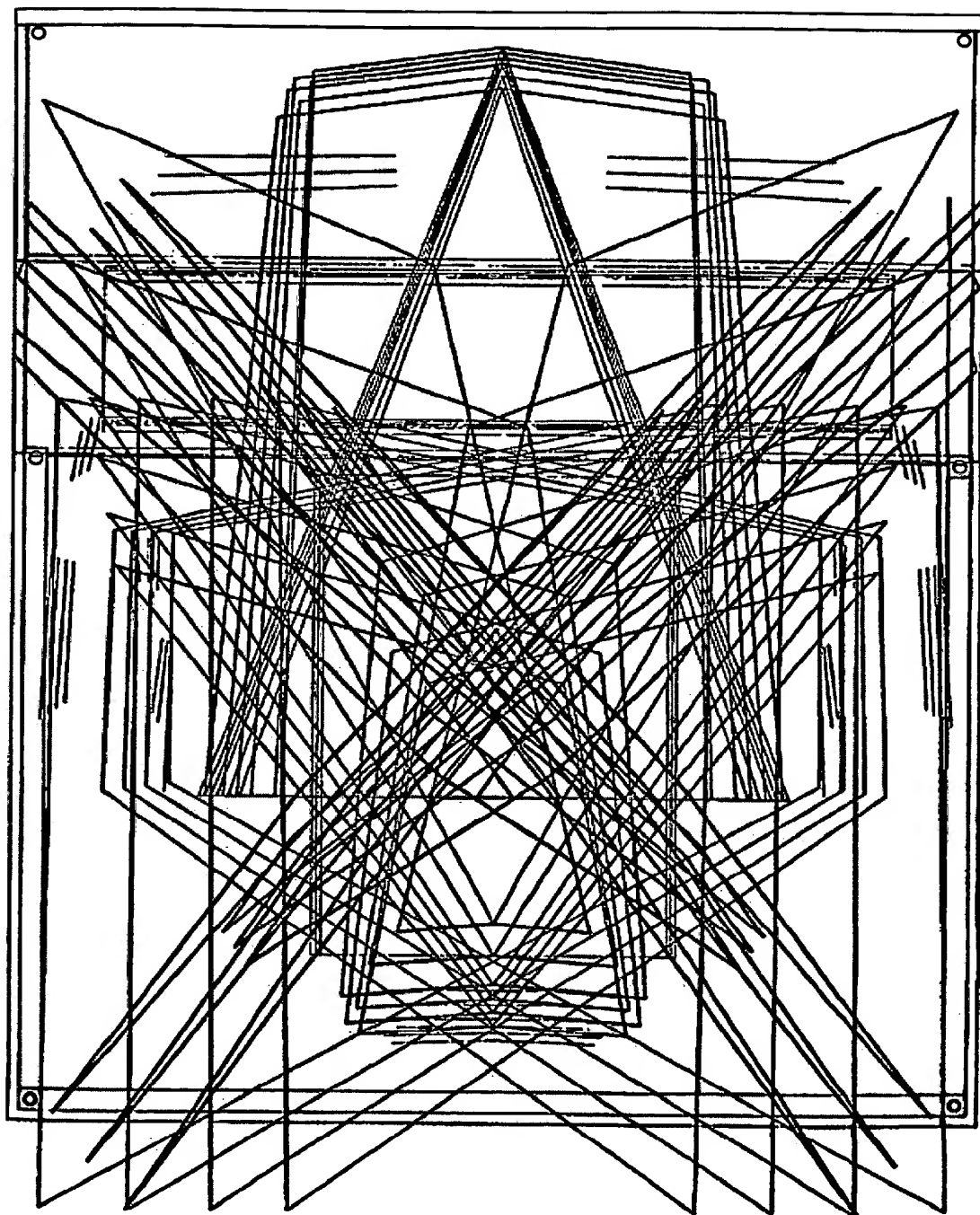
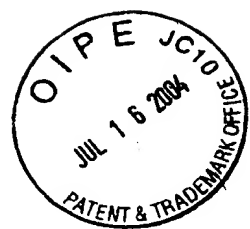


FIG. 5A3

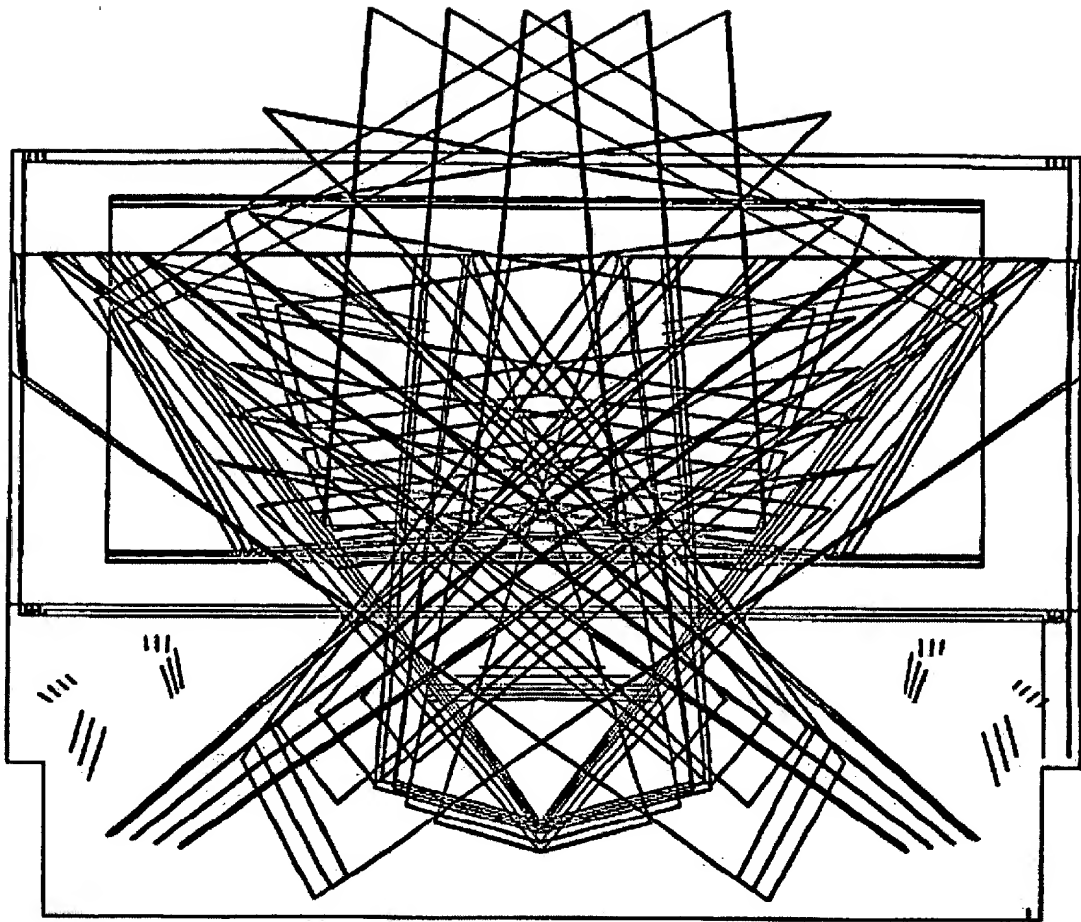
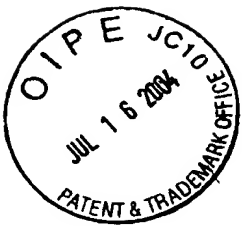


FIG. 5A4

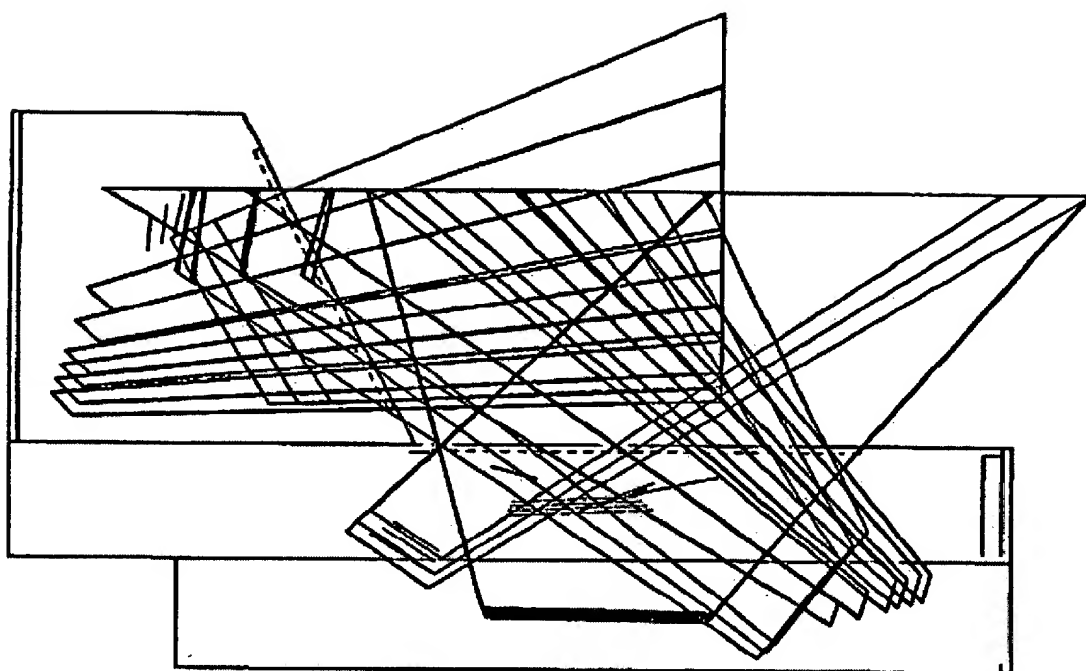
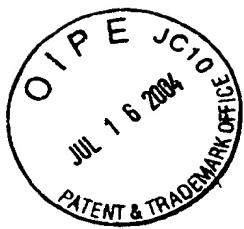


FIG. 5A5

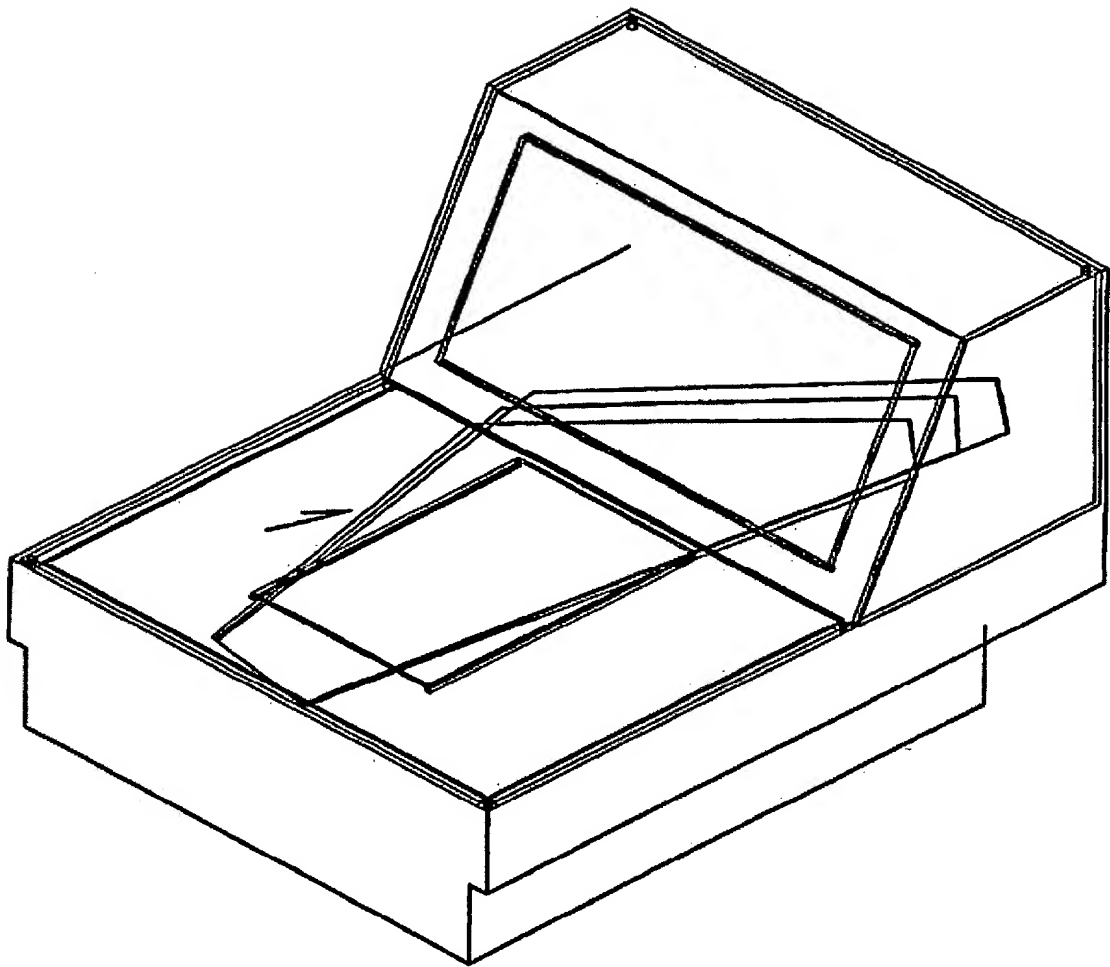
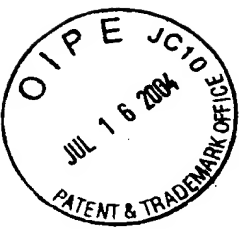


FIG. 5B1

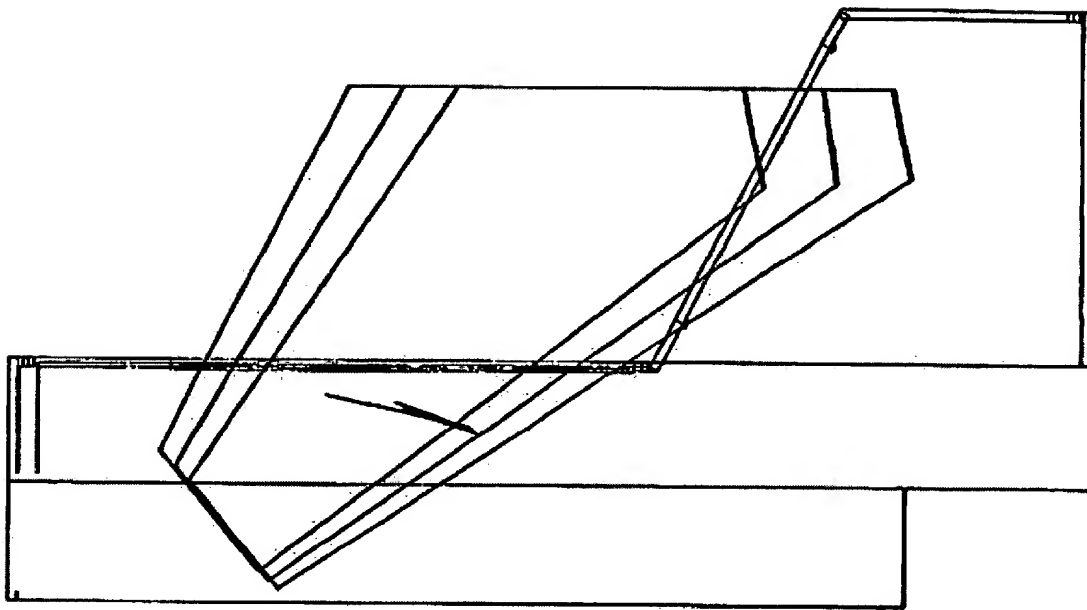
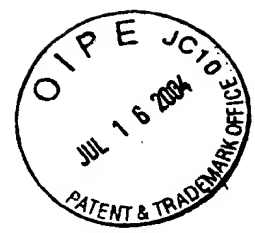


FIG. 5B2

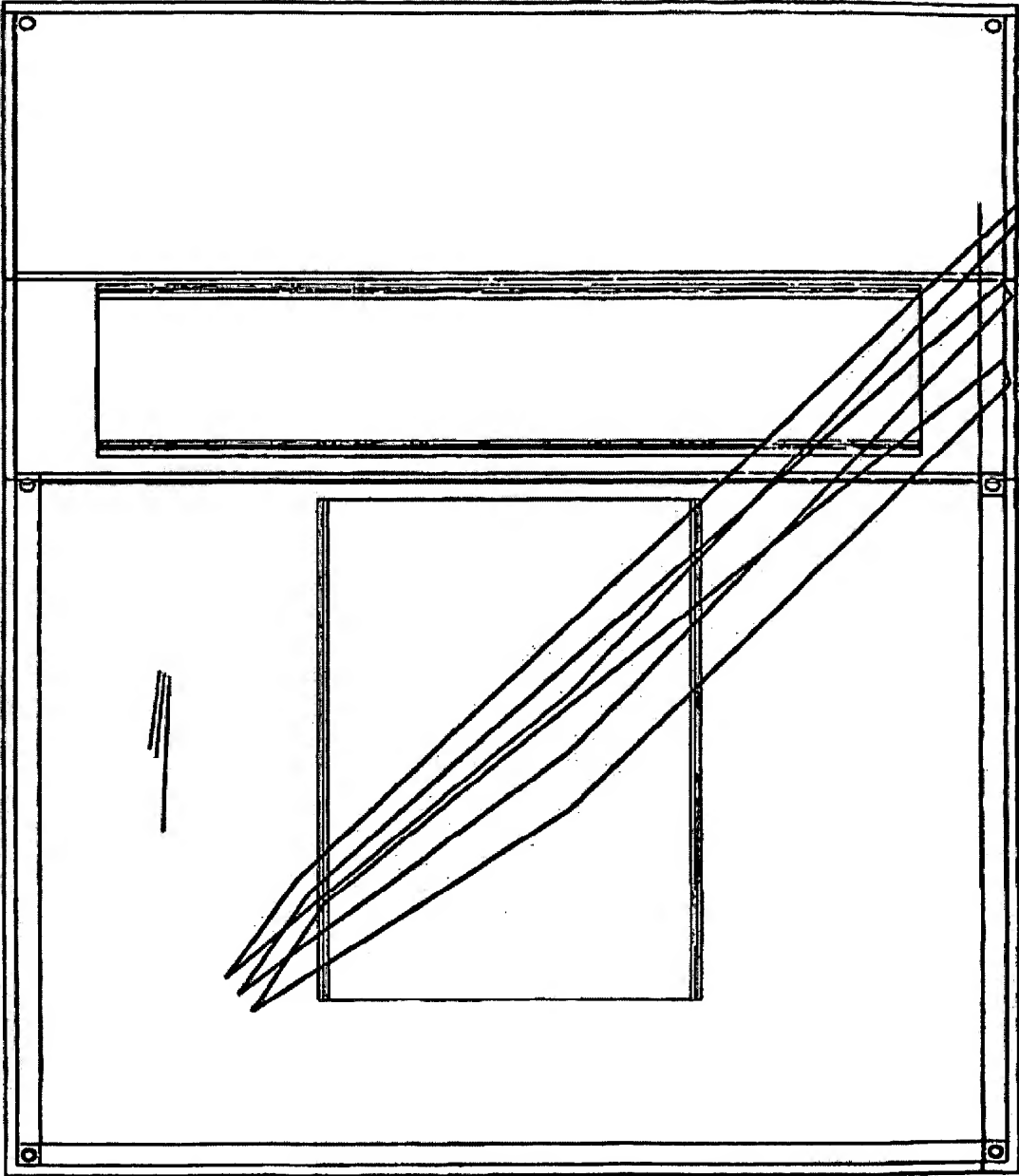
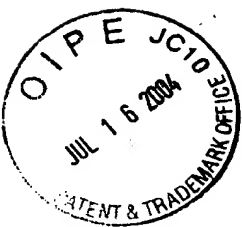


FIG. 5B3

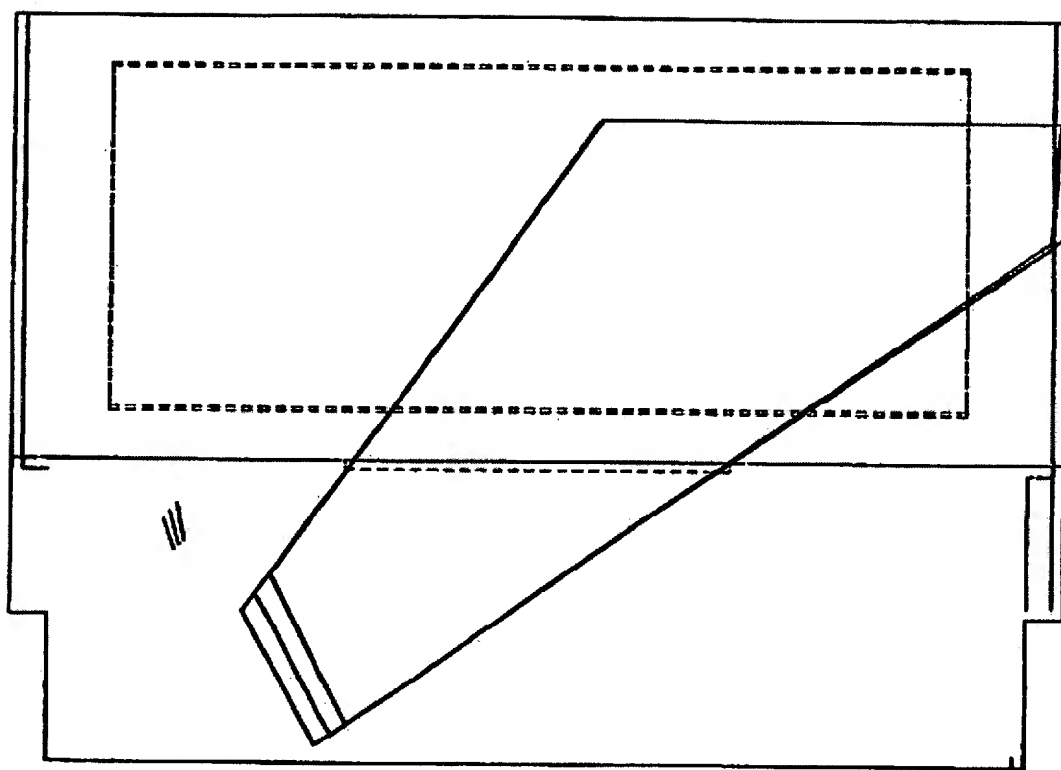
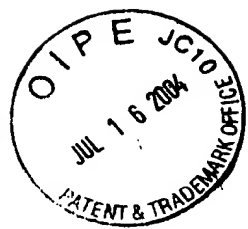


FIG. 5B4

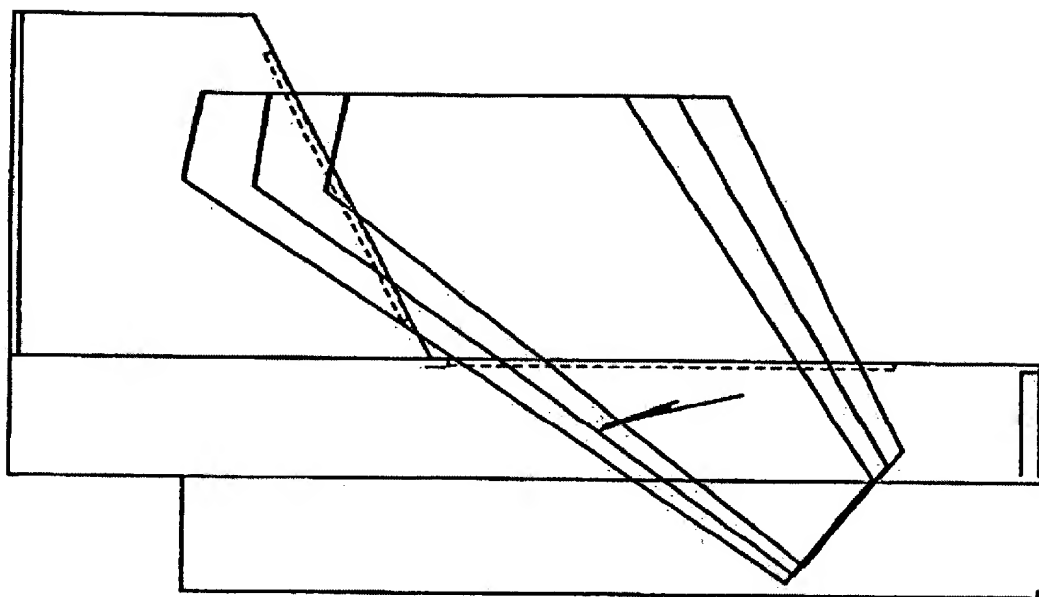
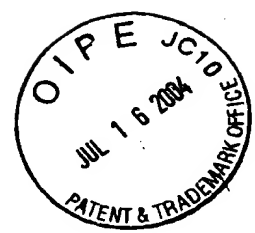


FIG. 5B5

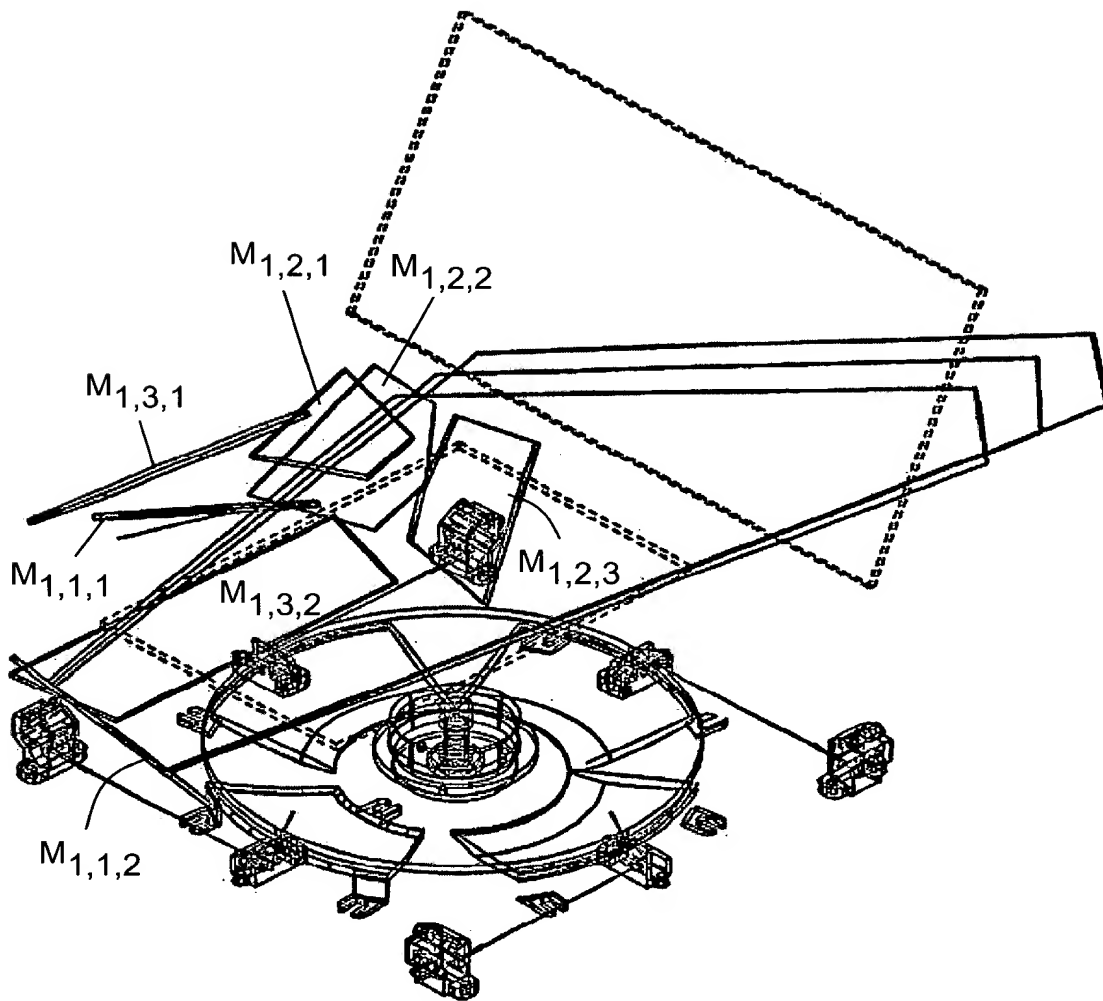


FIG. 5C1

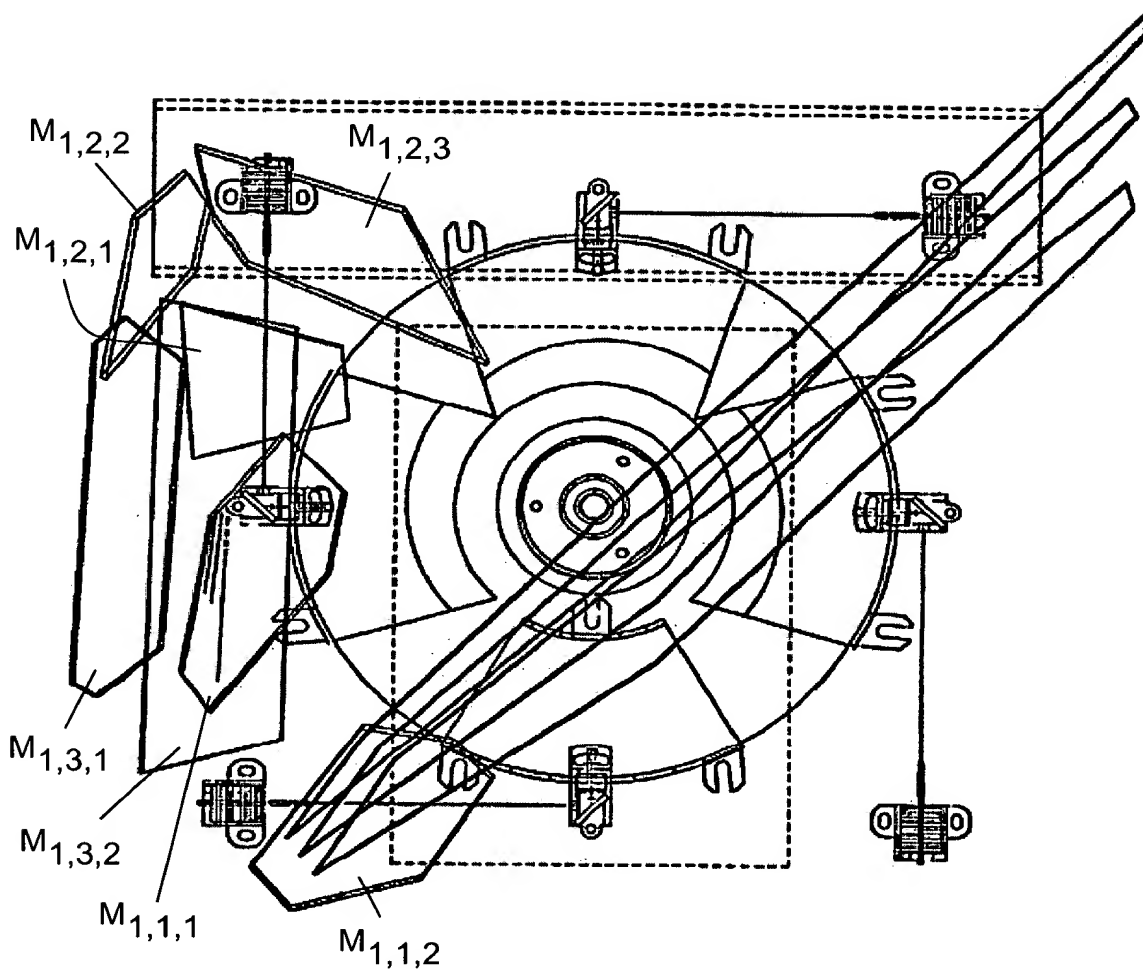


FIG. 5C2

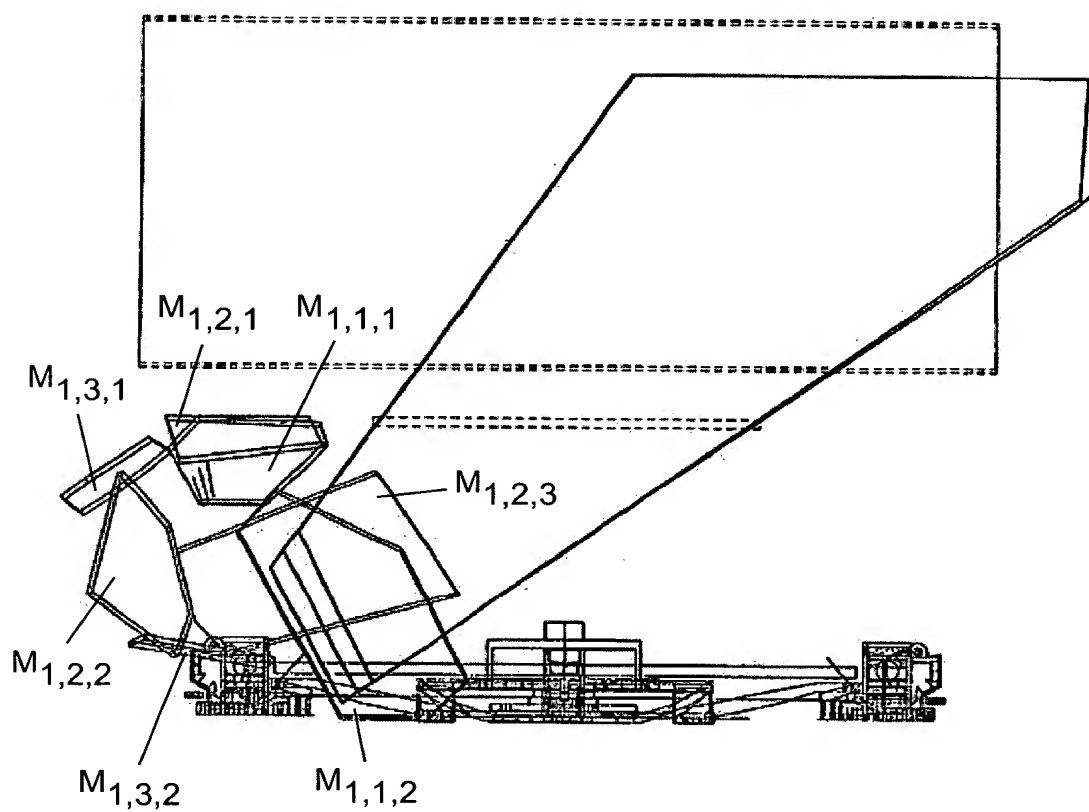


FIG. 5C3

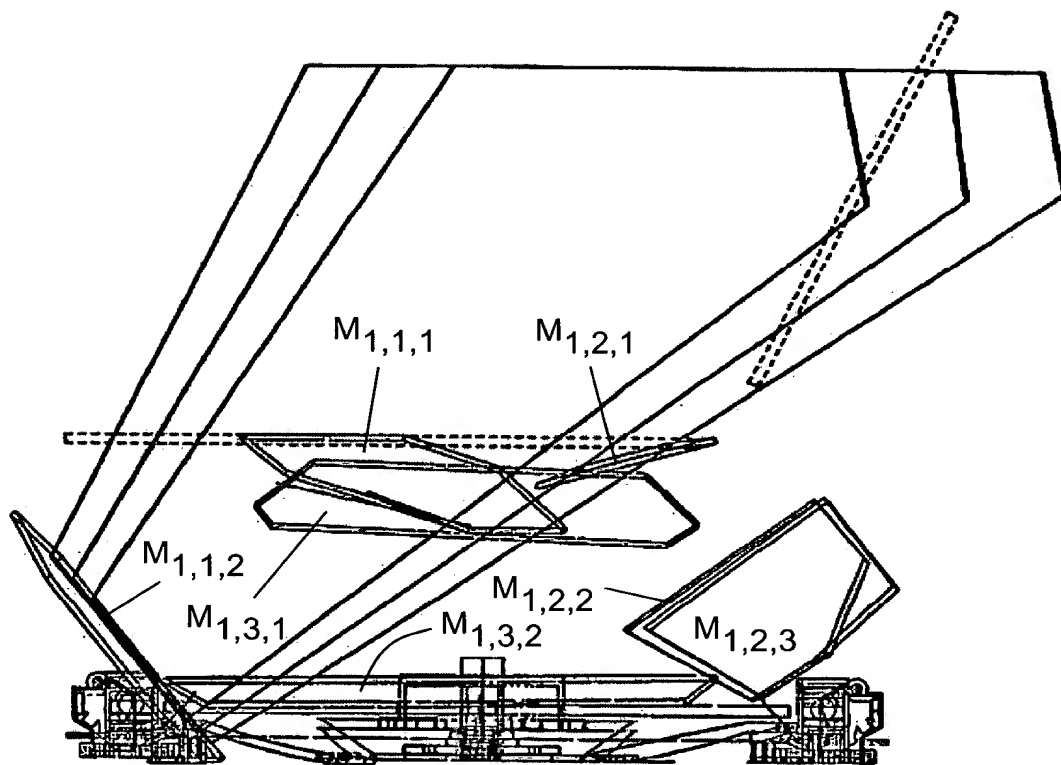
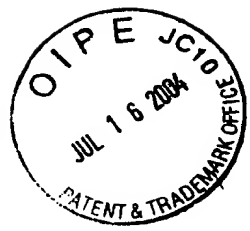


FIG. 5C4

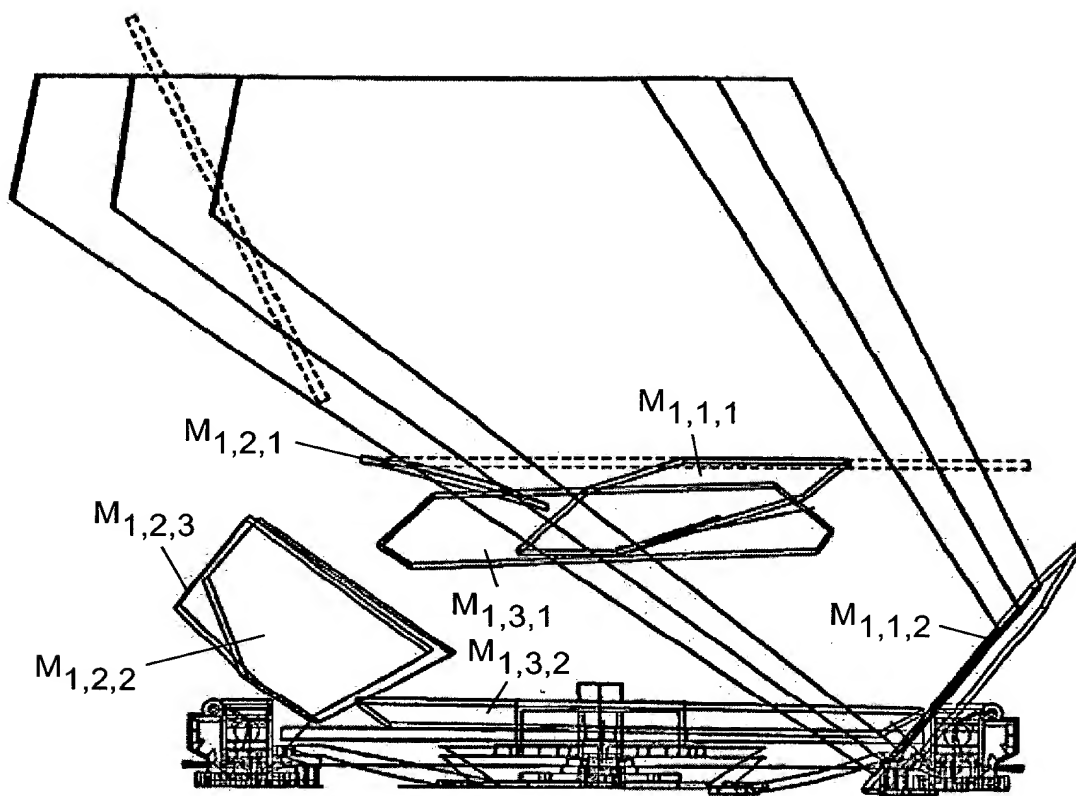
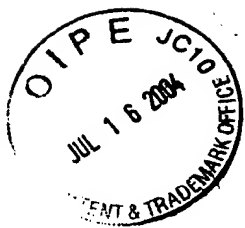


FIG. 5C5

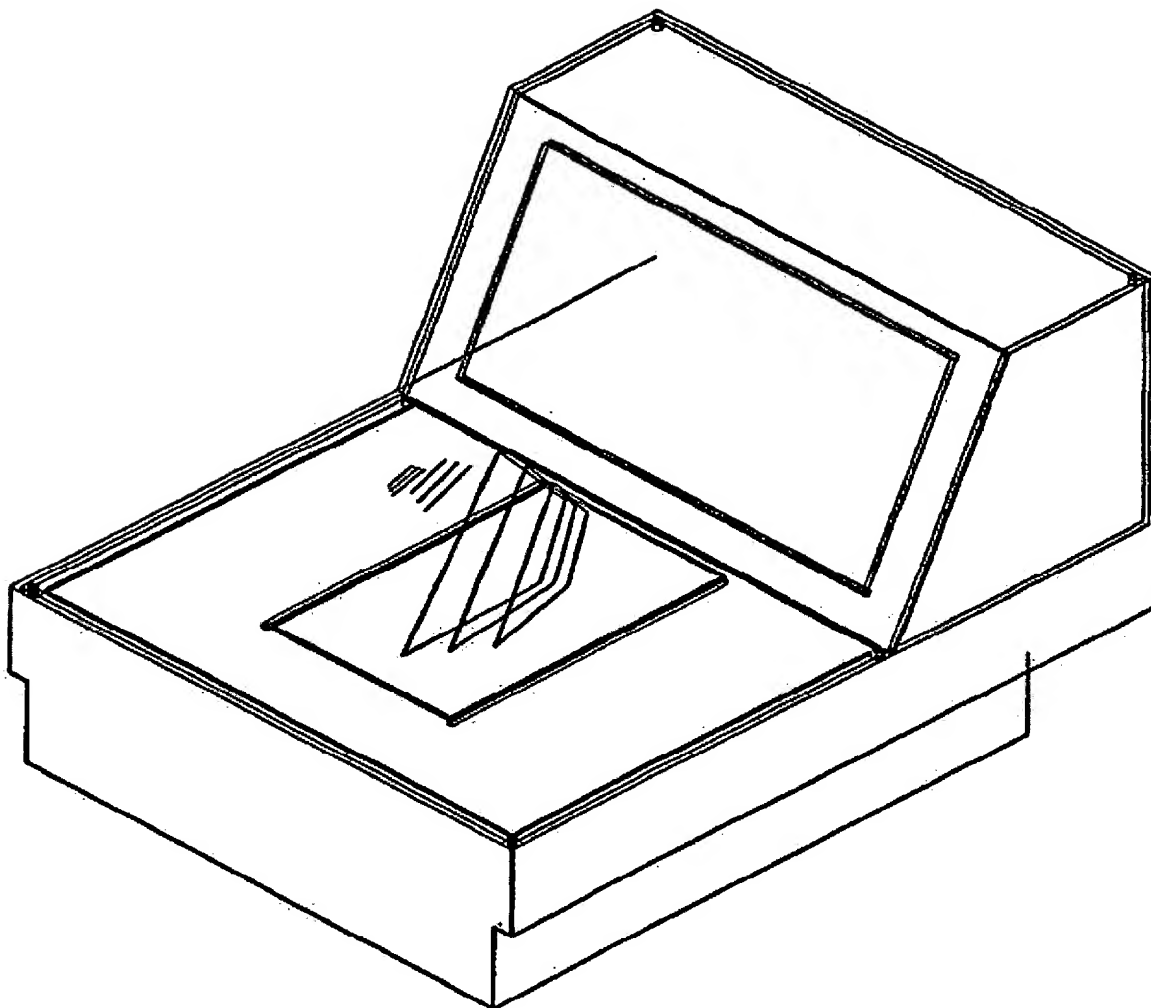
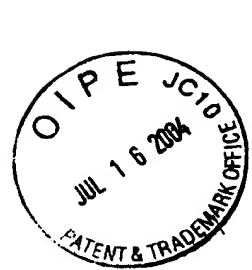


FIG. 5D1

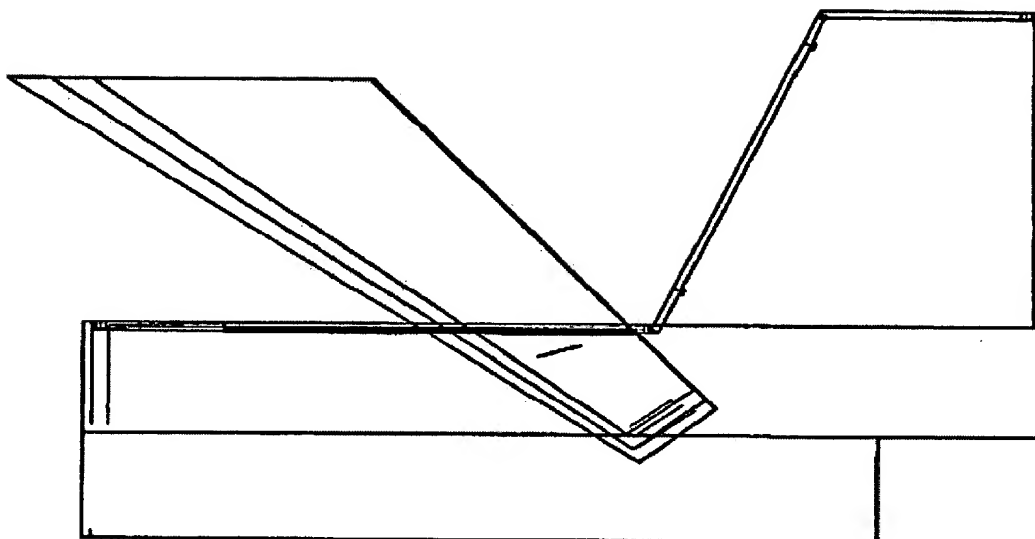


FIG. 5D2

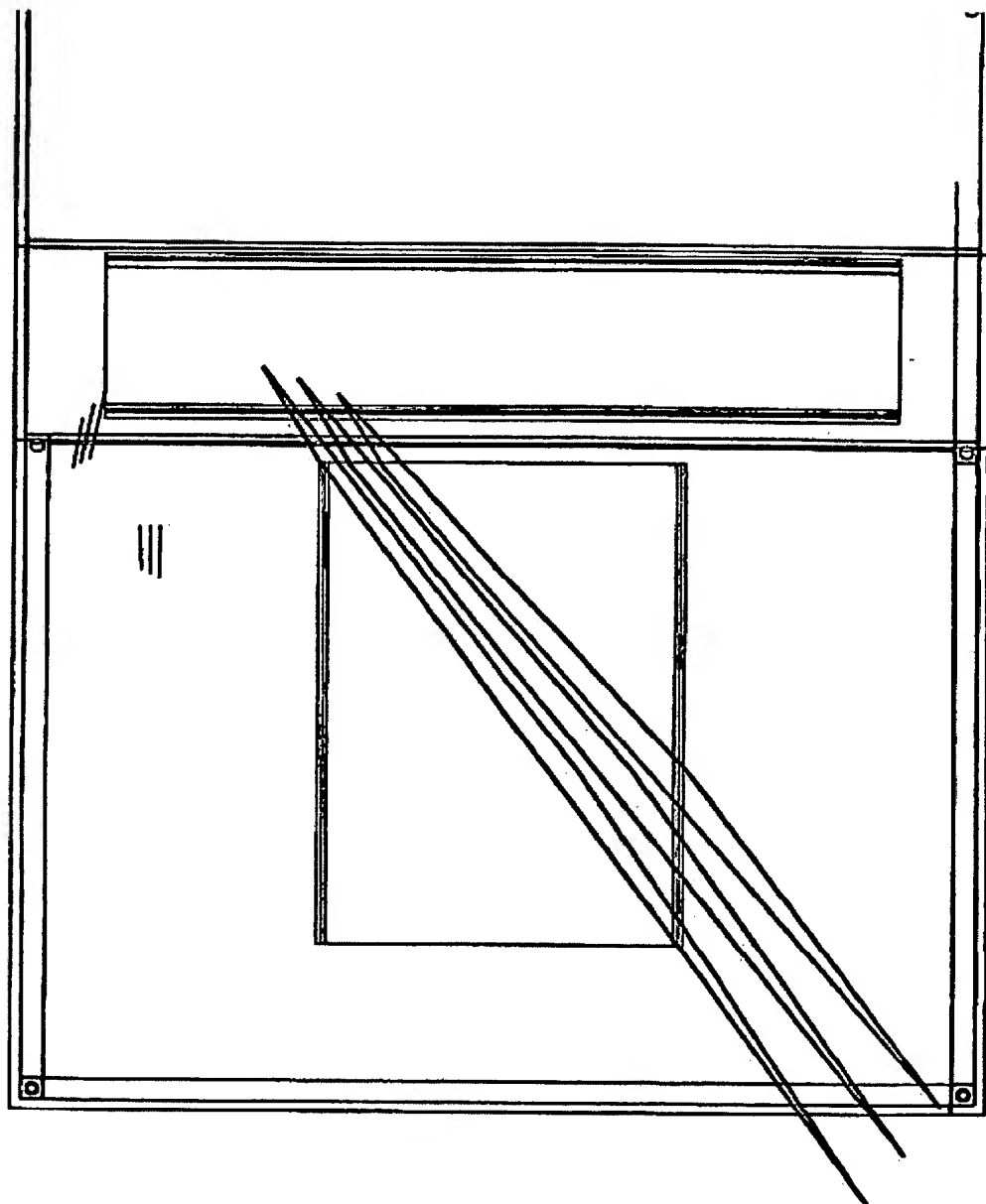
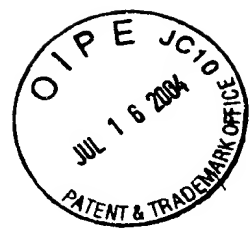


FIG. 5D3

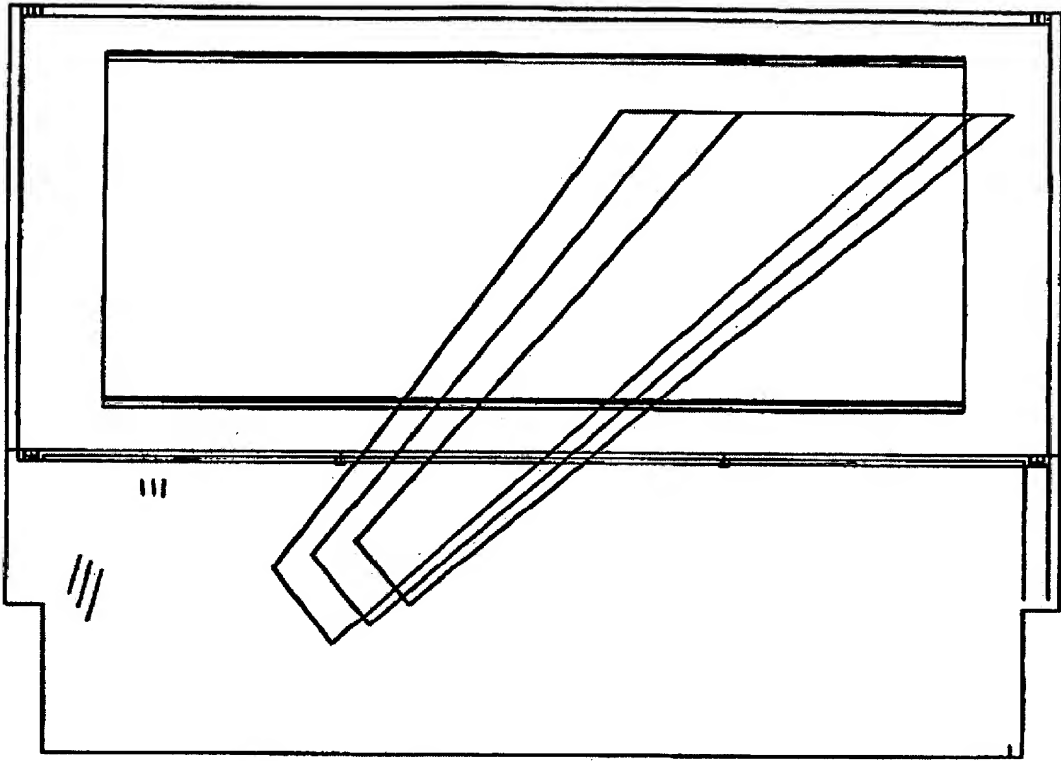
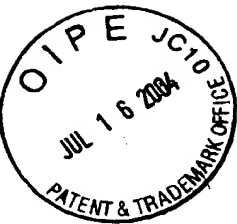


FIG. 5D4

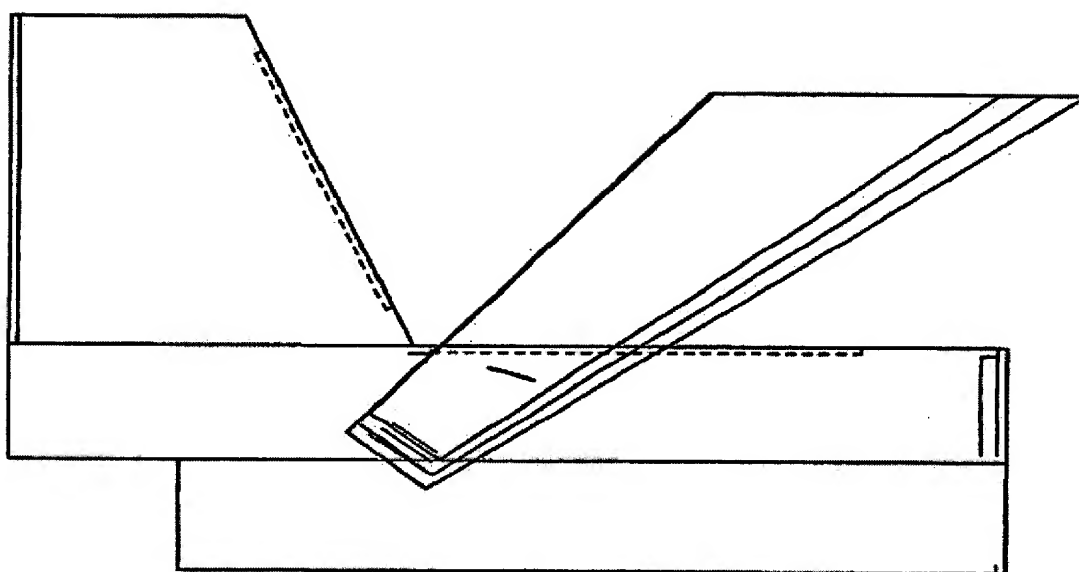
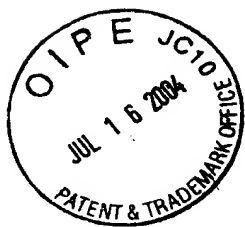


FIG. 5D5

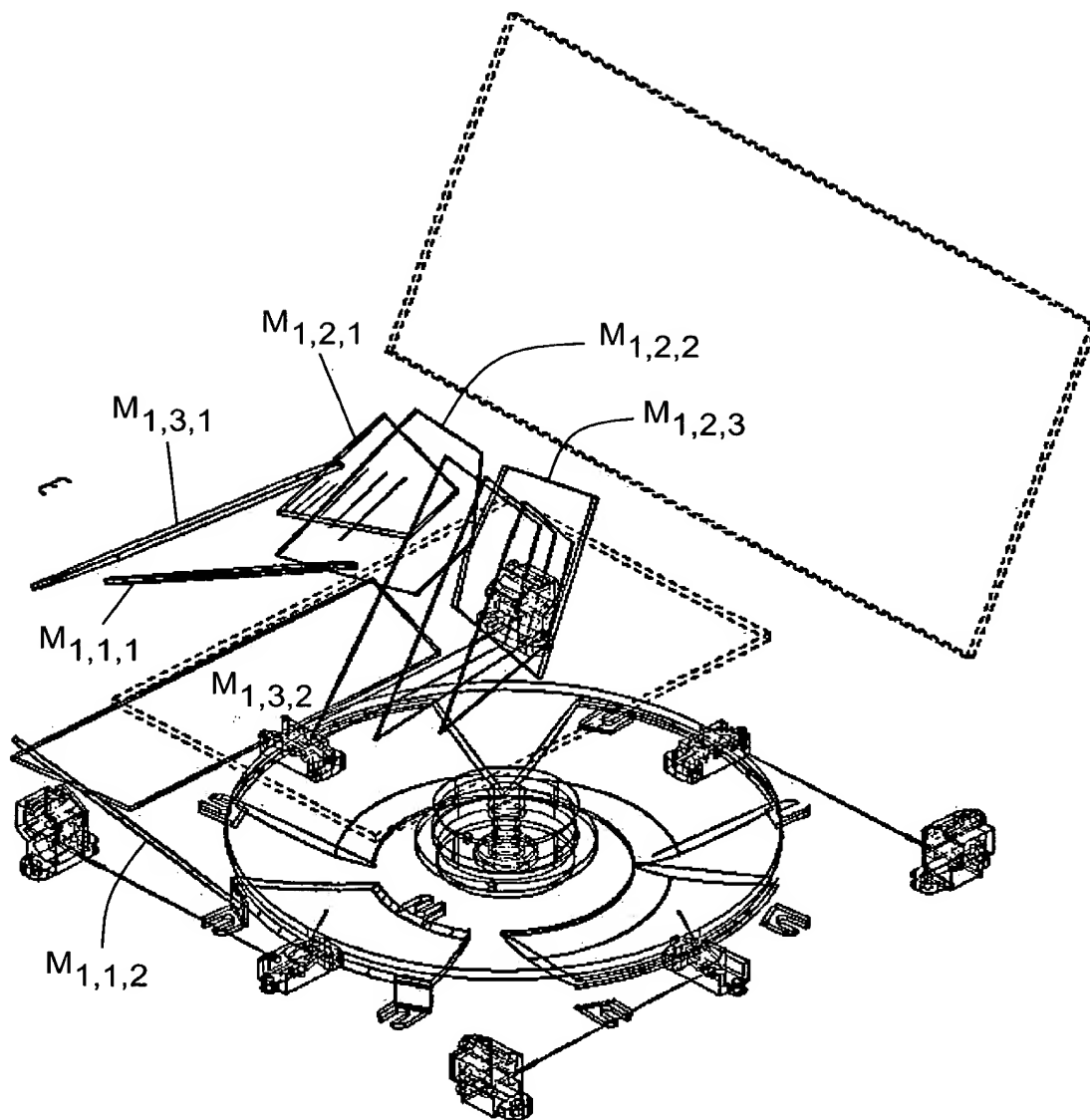


FIG. 5E1

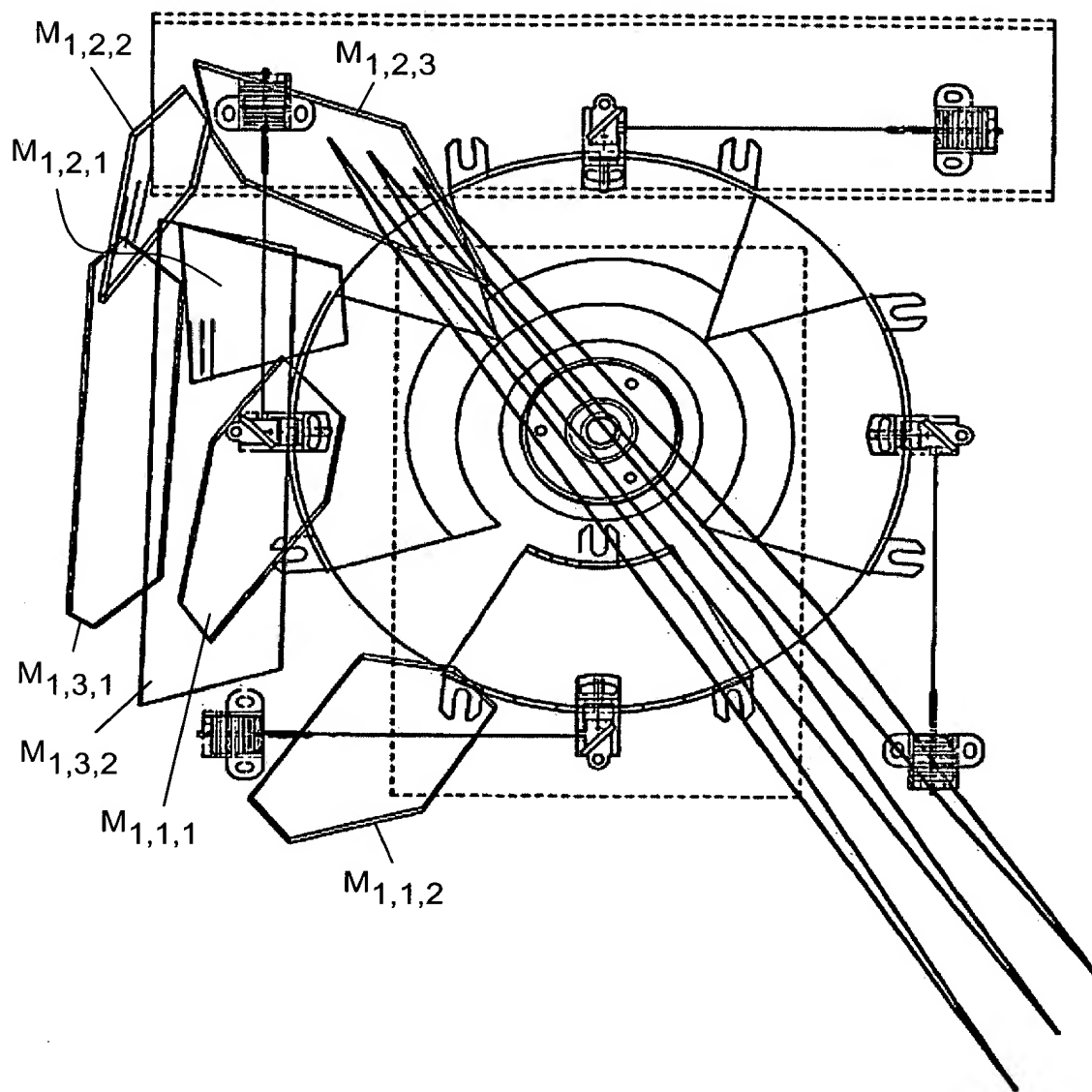


FIG. 5E2

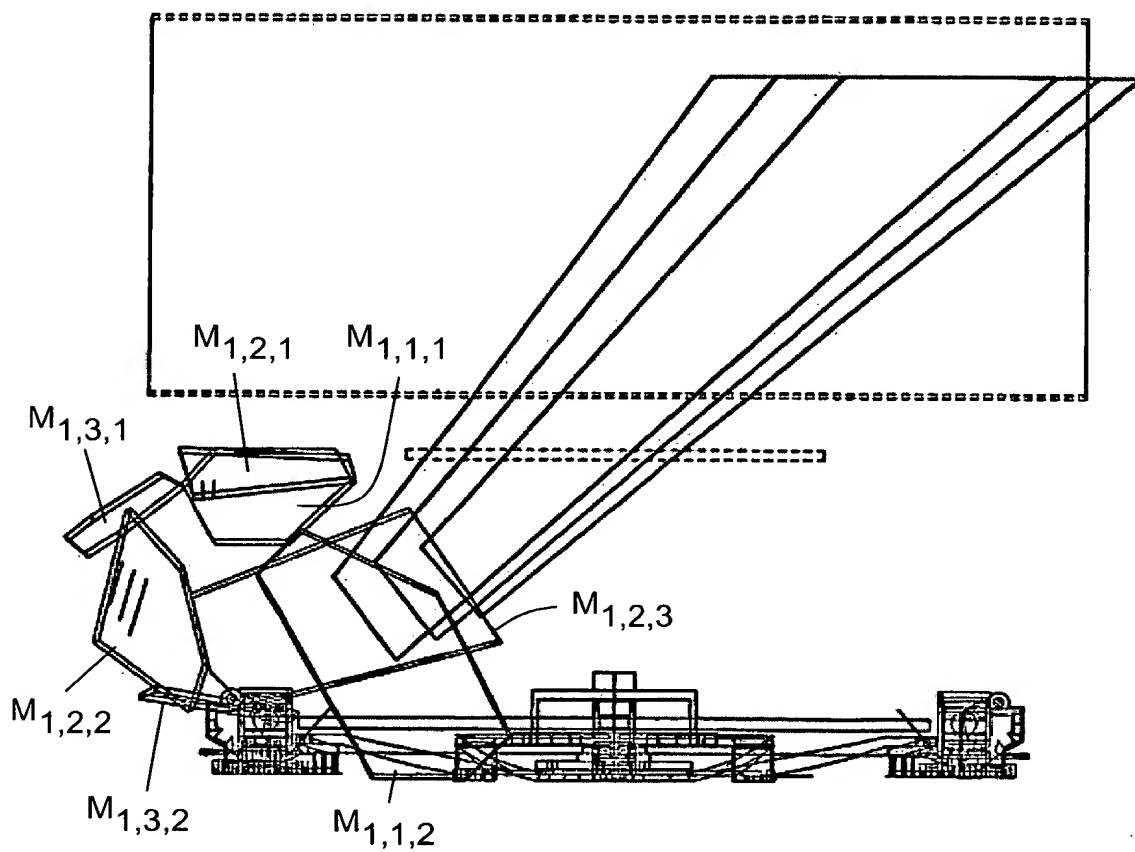


FIG. 5E3

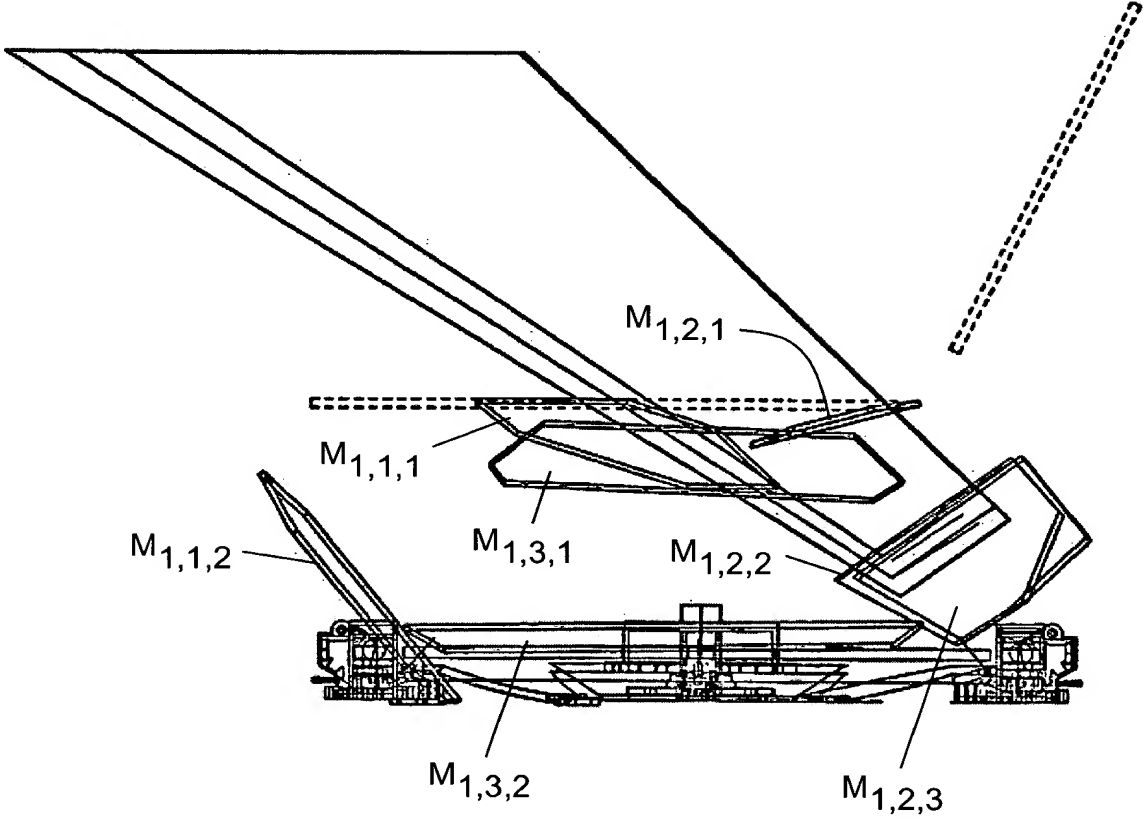
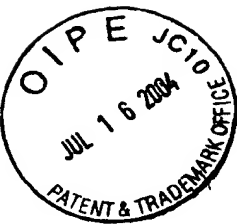


FIG. 5E4

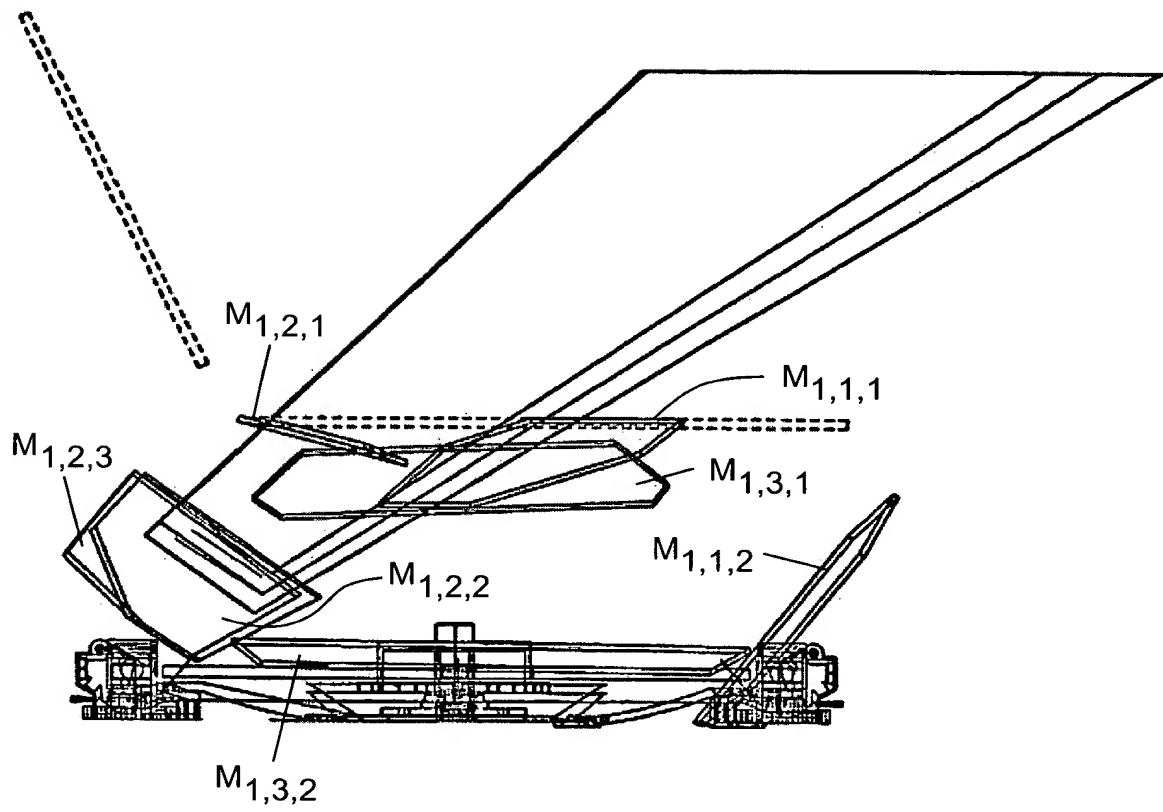


FIG. 5E5

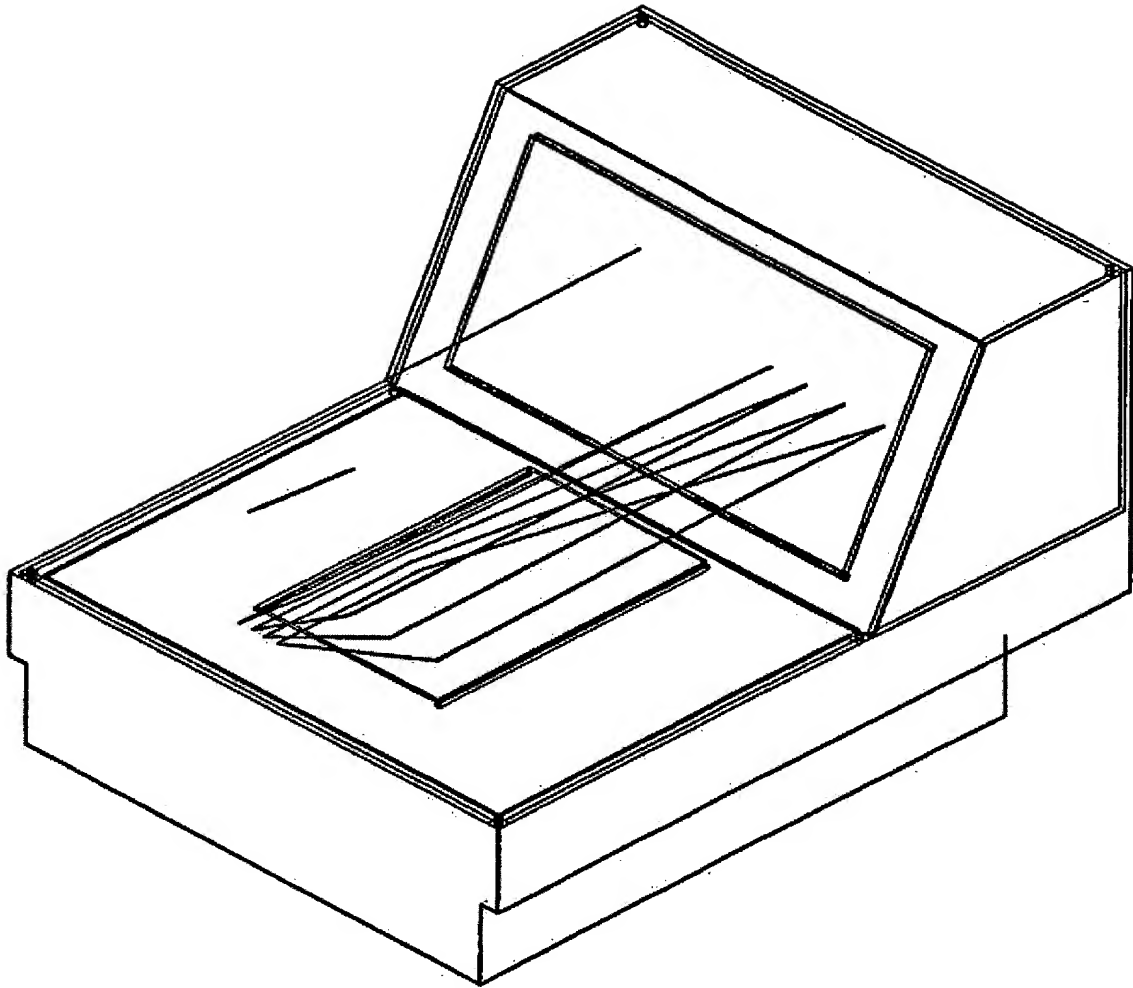
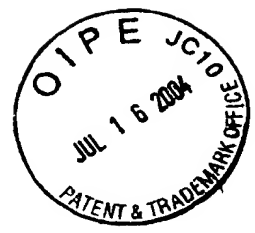


FIG. 5F1

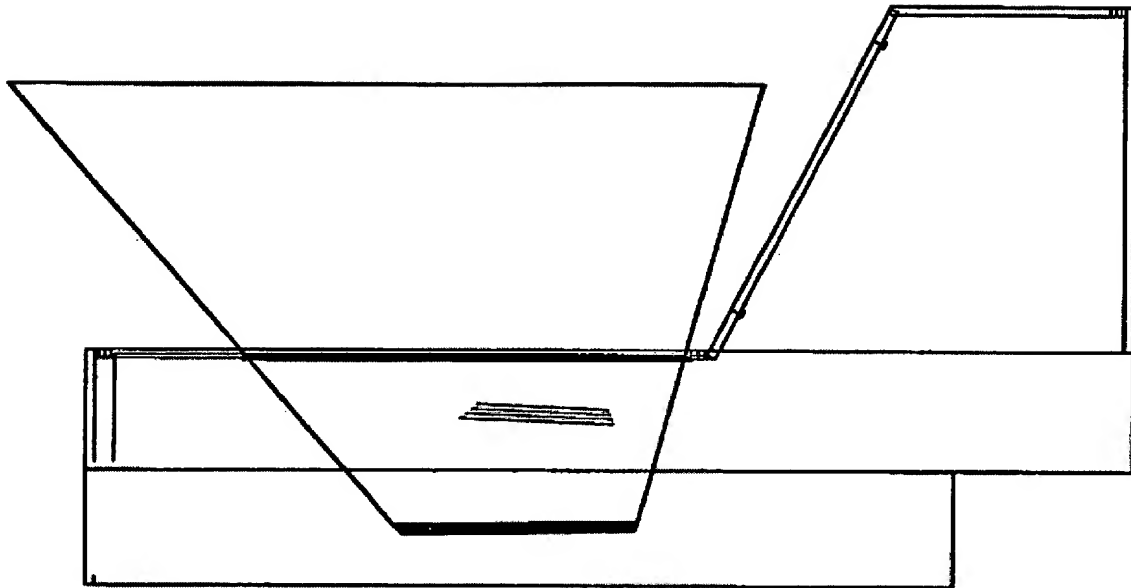


FIG. 5F2

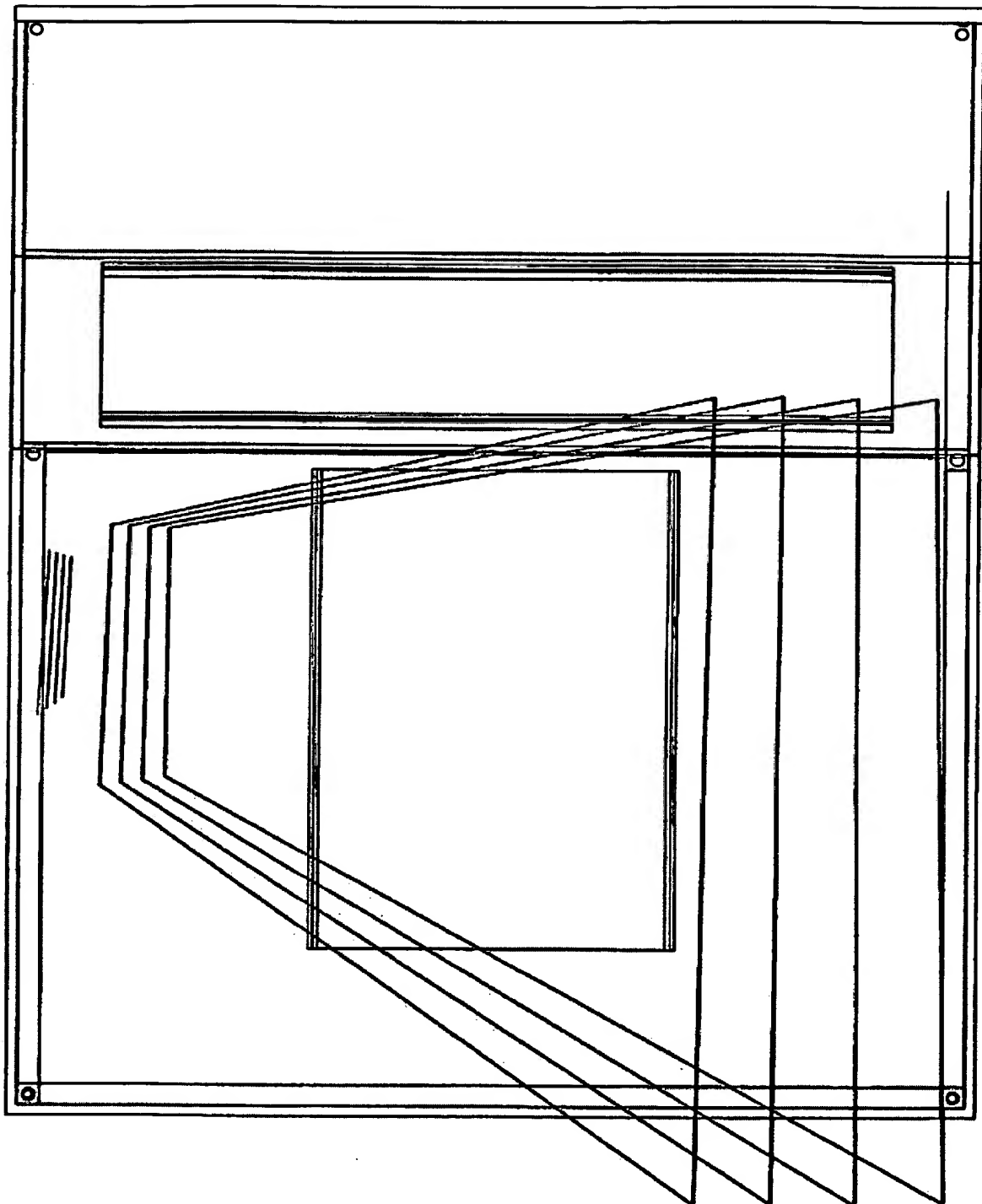
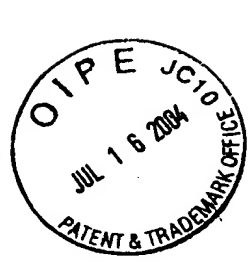


FIG. 5F3

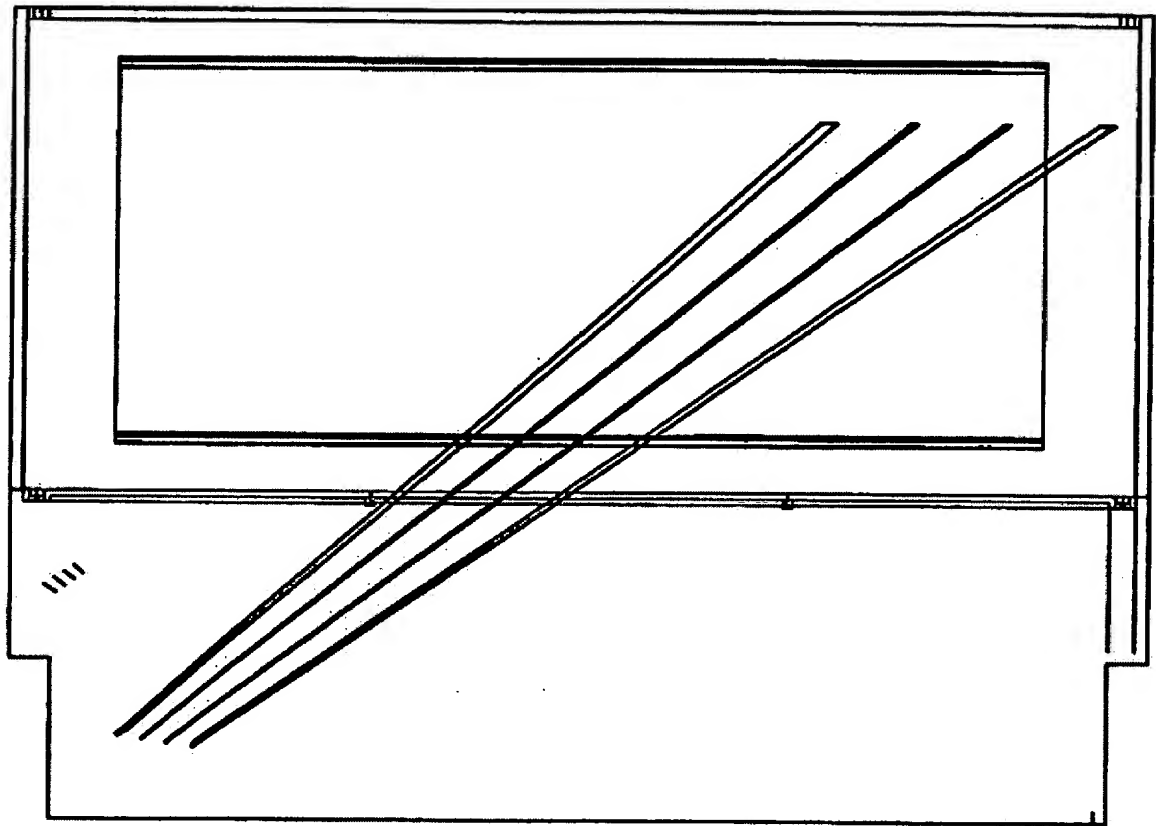
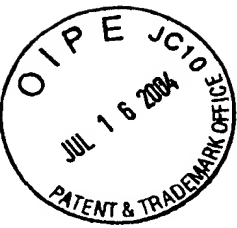


FIG. 5F4

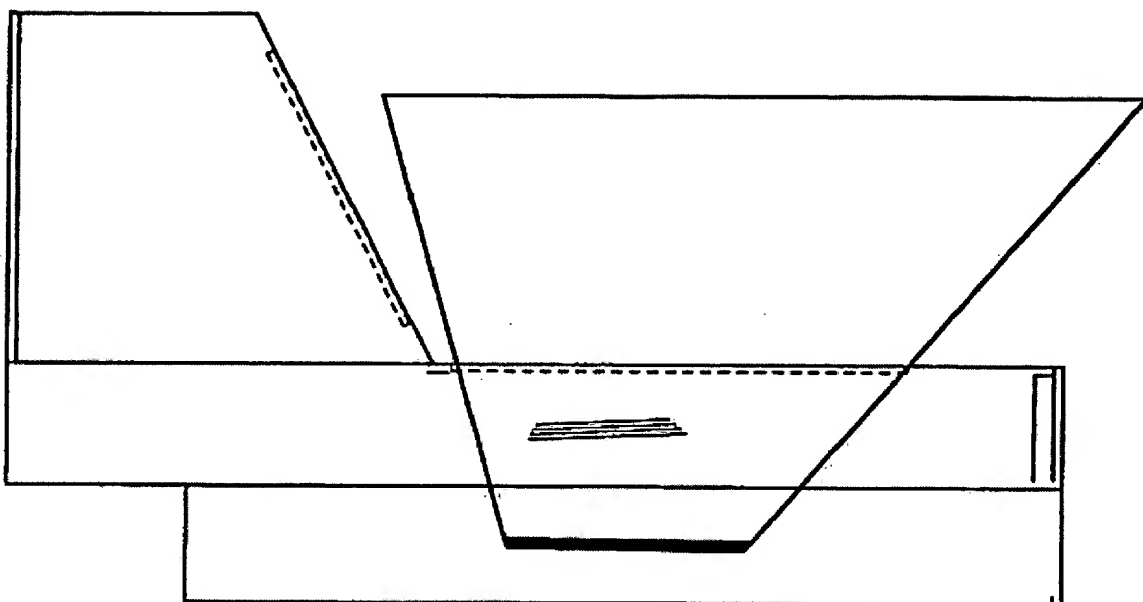
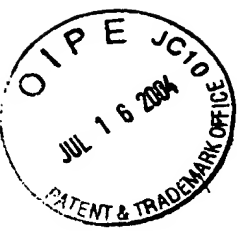


FIG. 5F5

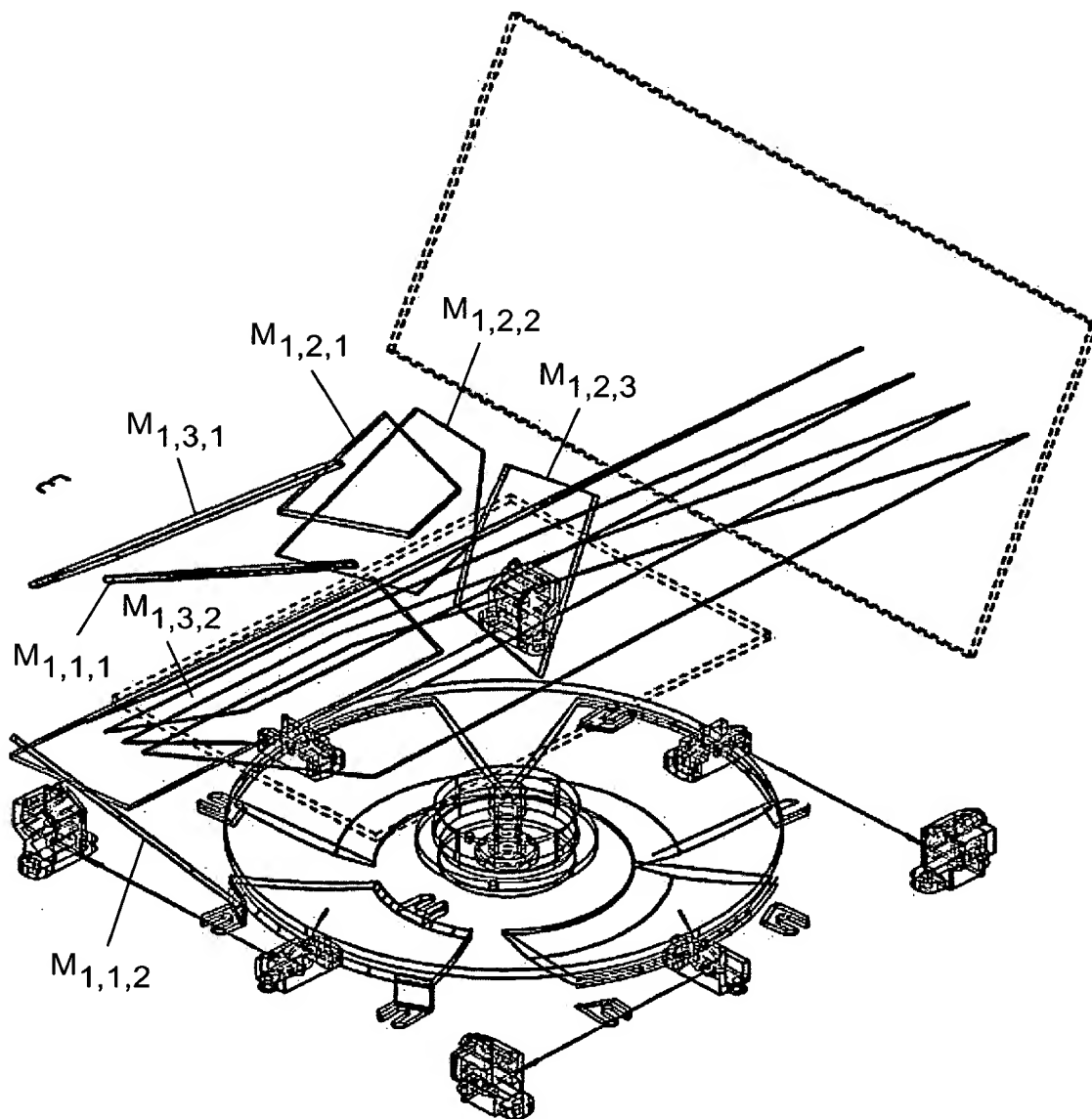


FIG. 5G1

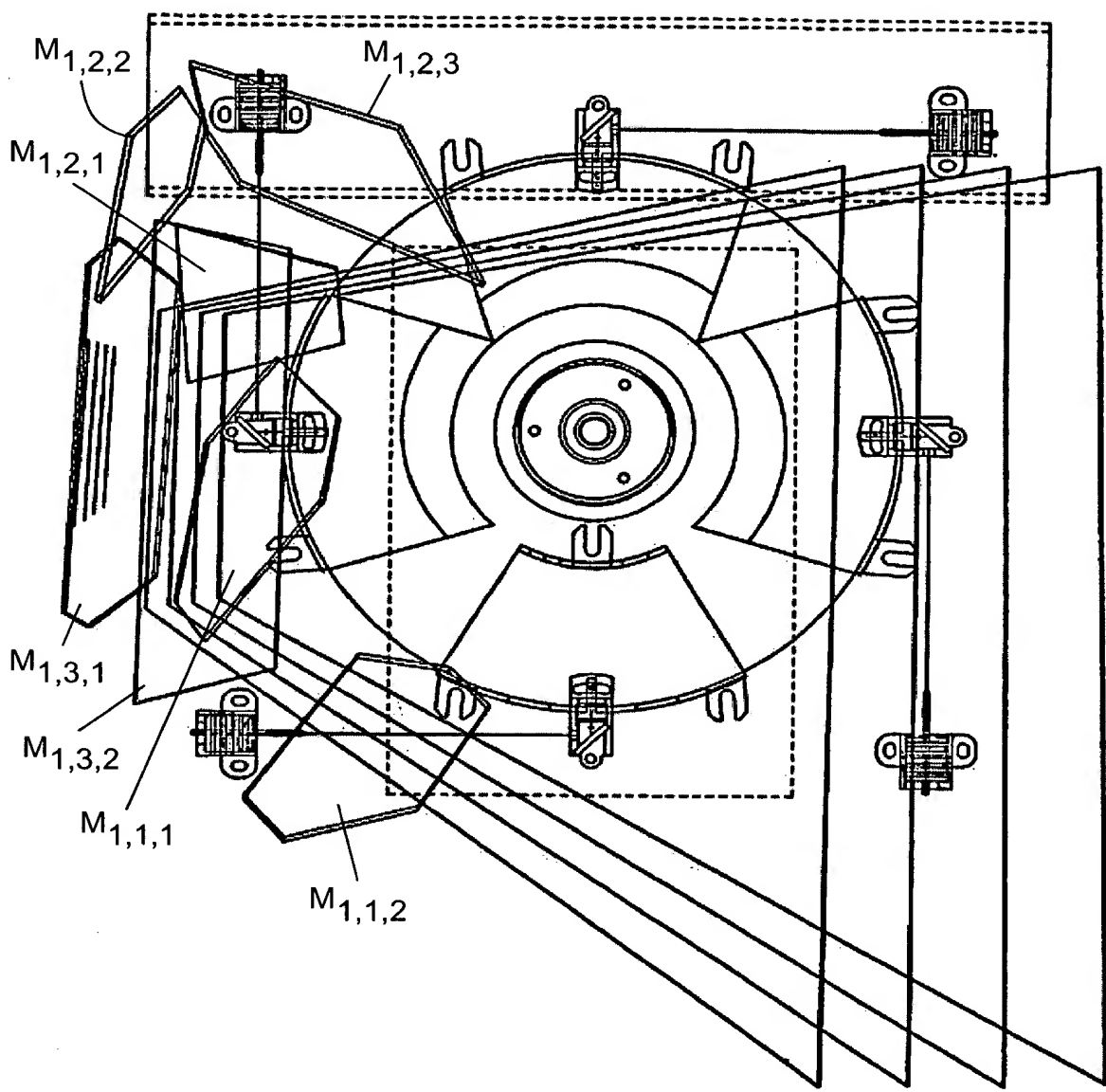


FIG. 5G2

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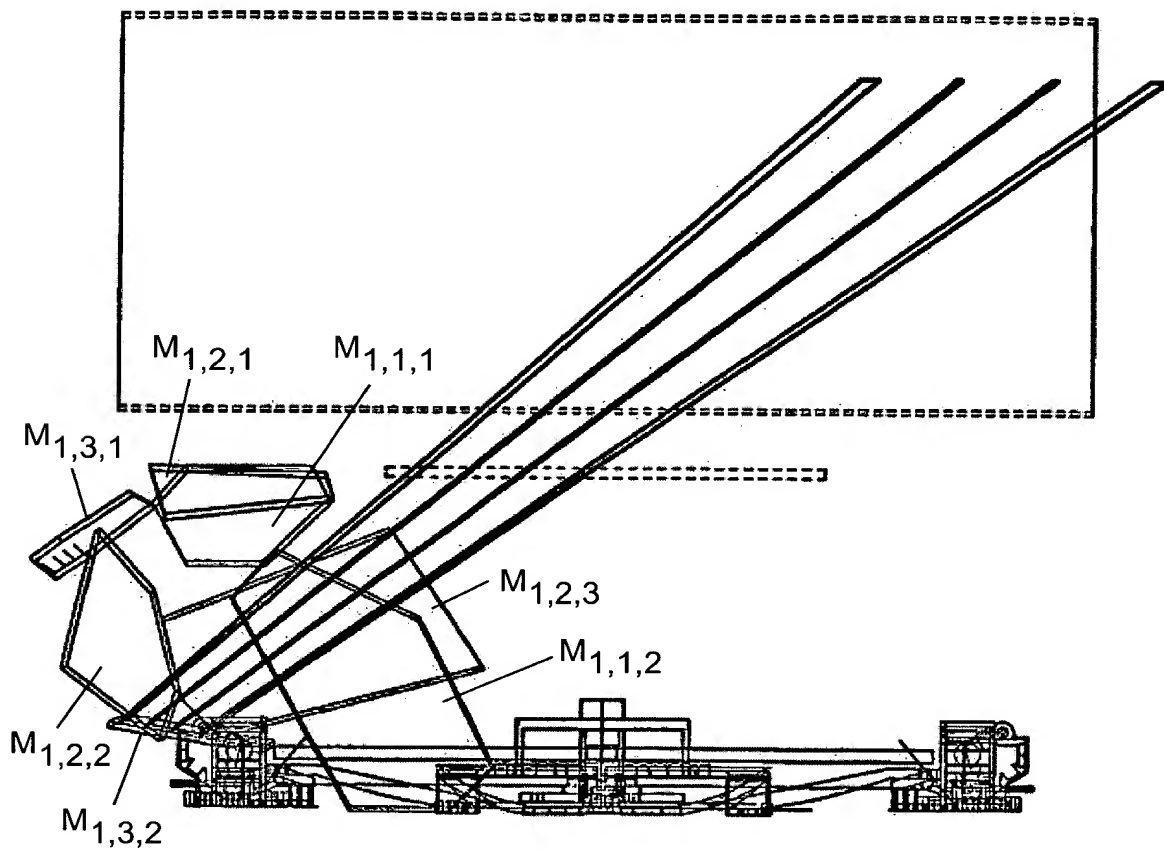


FIG. 5G3

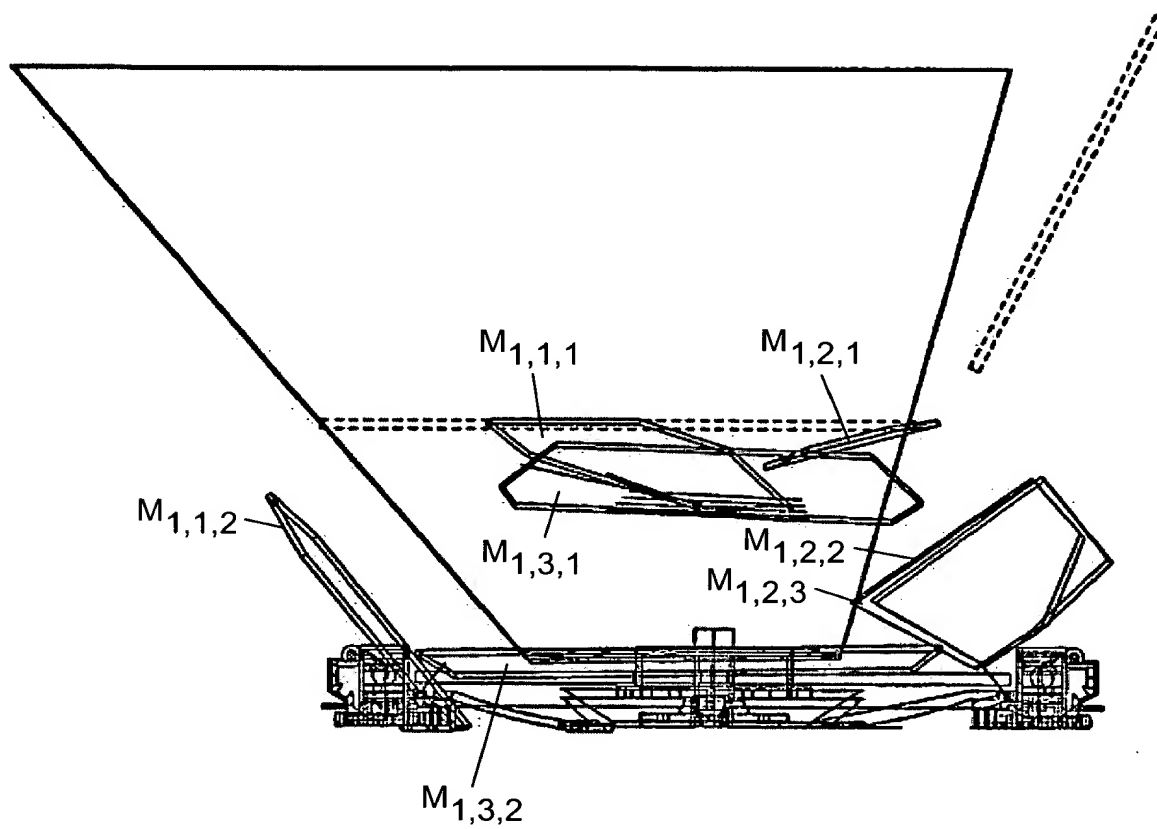
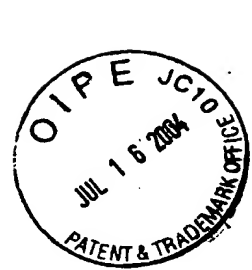


FIG. 5G4

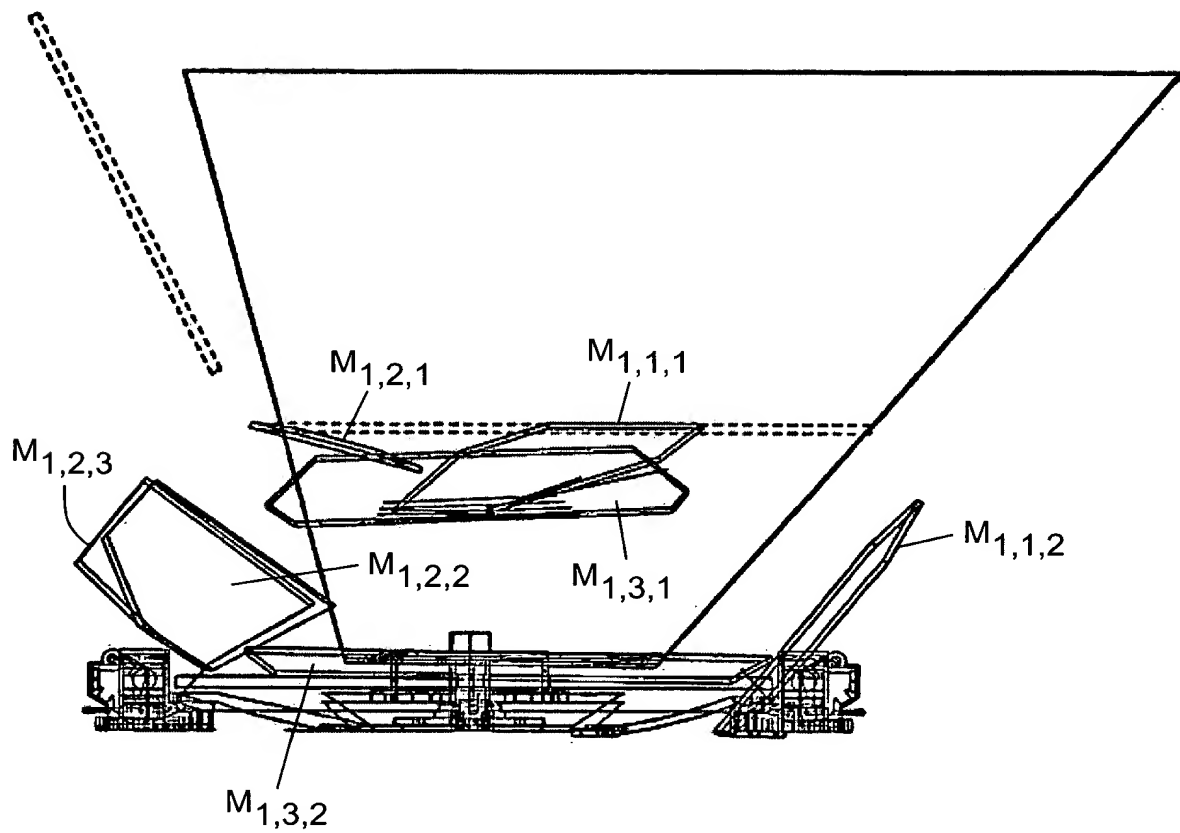


FIG. 5G5

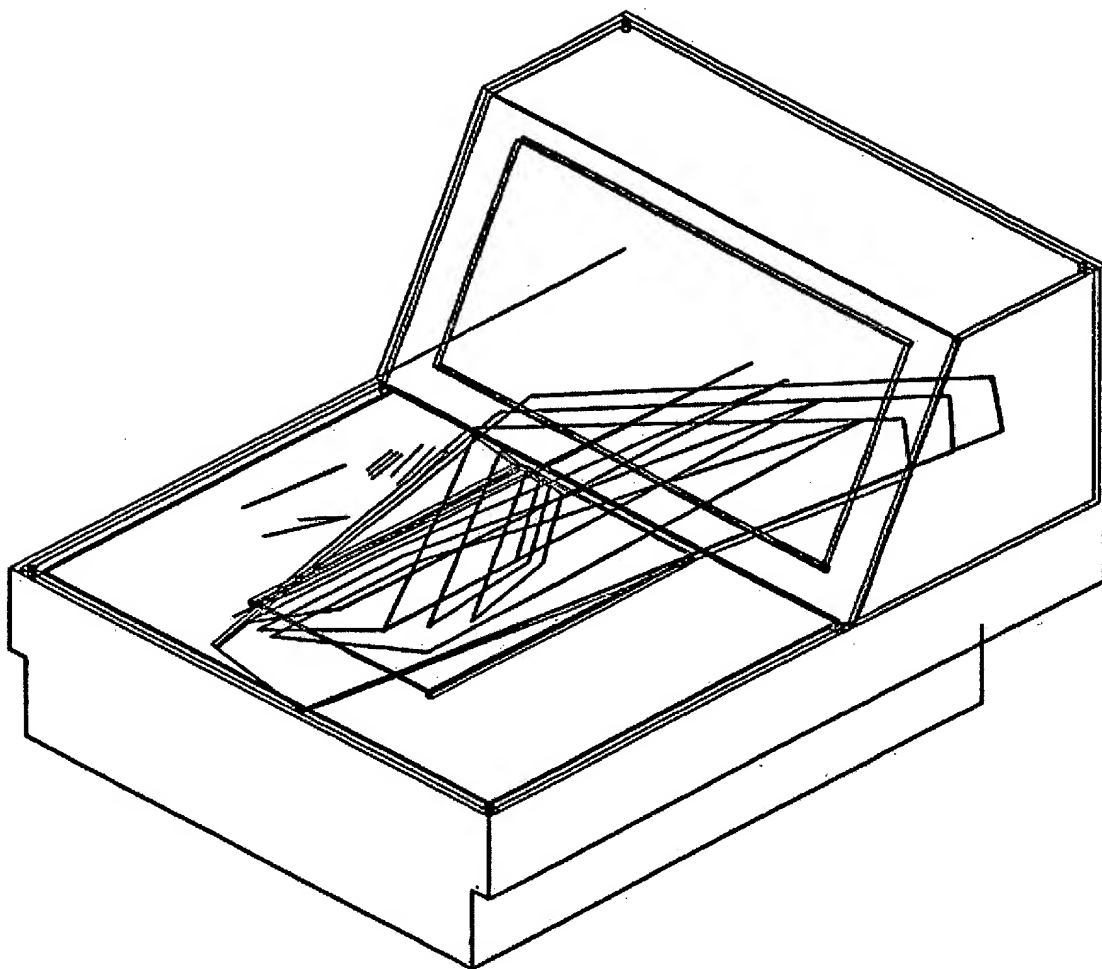
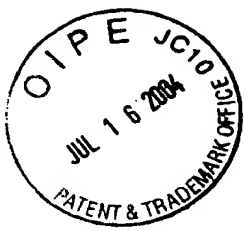


FIG. 5H1

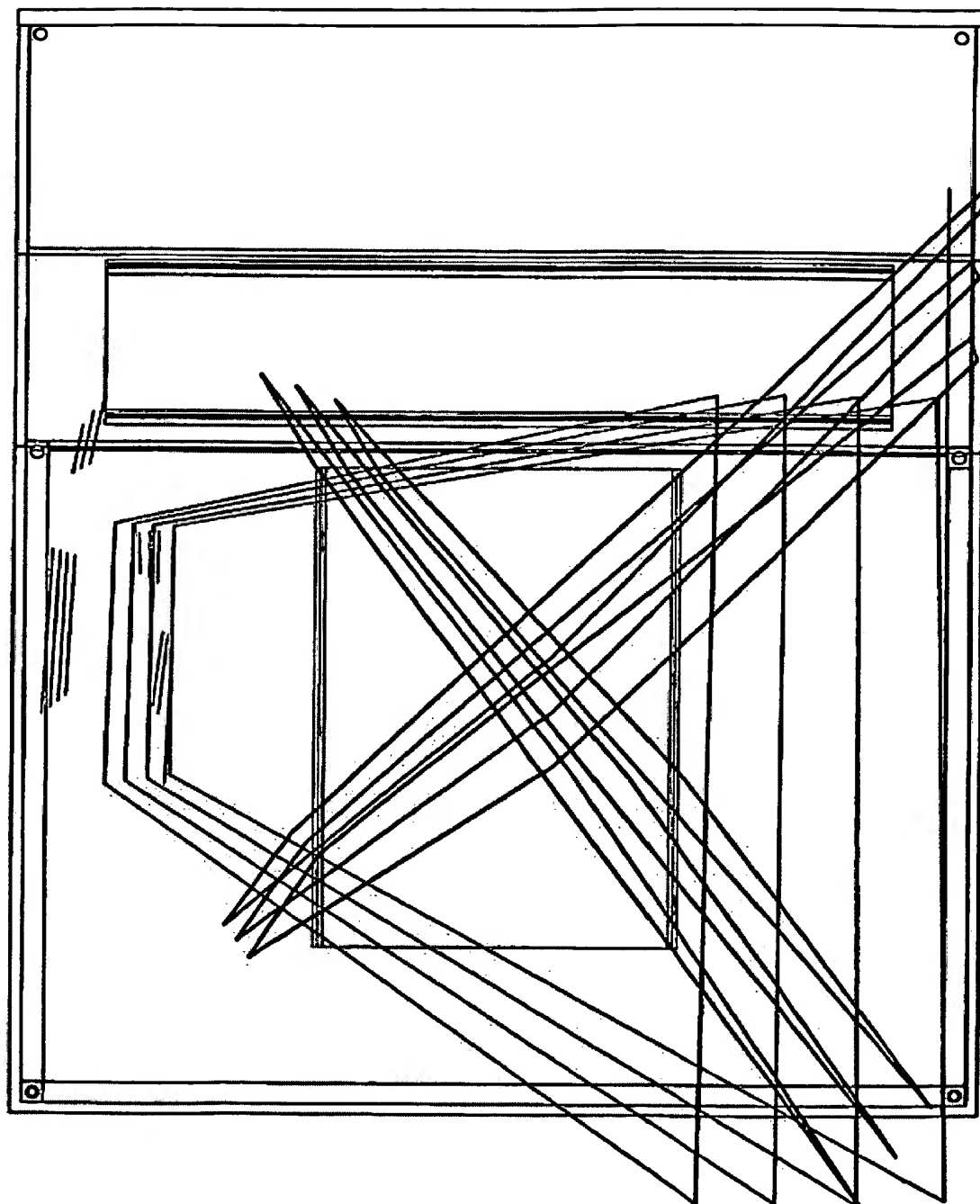
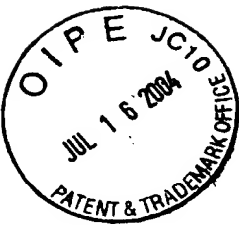


FIG. 5H2

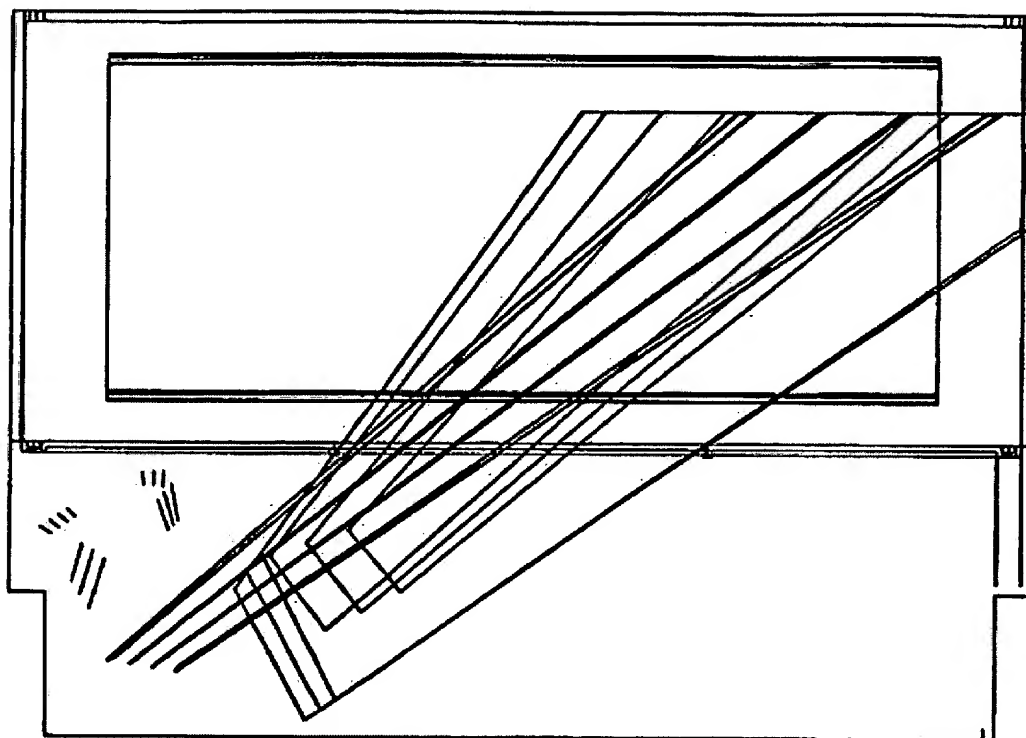
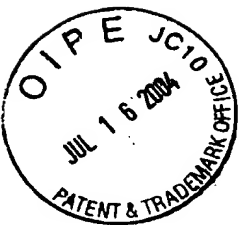


FIG. 5H3

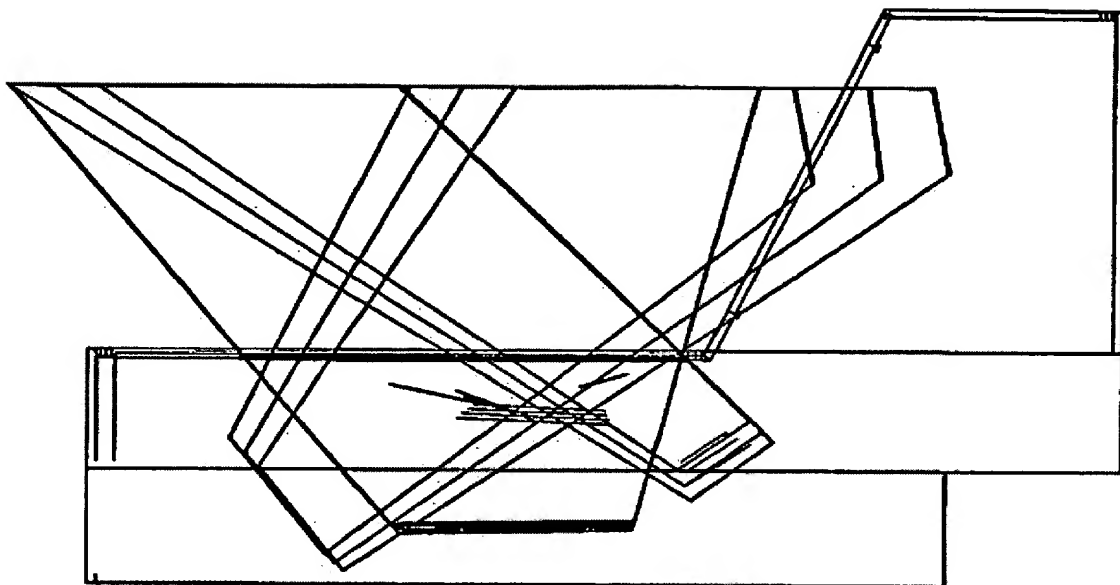


FIG. 5H4

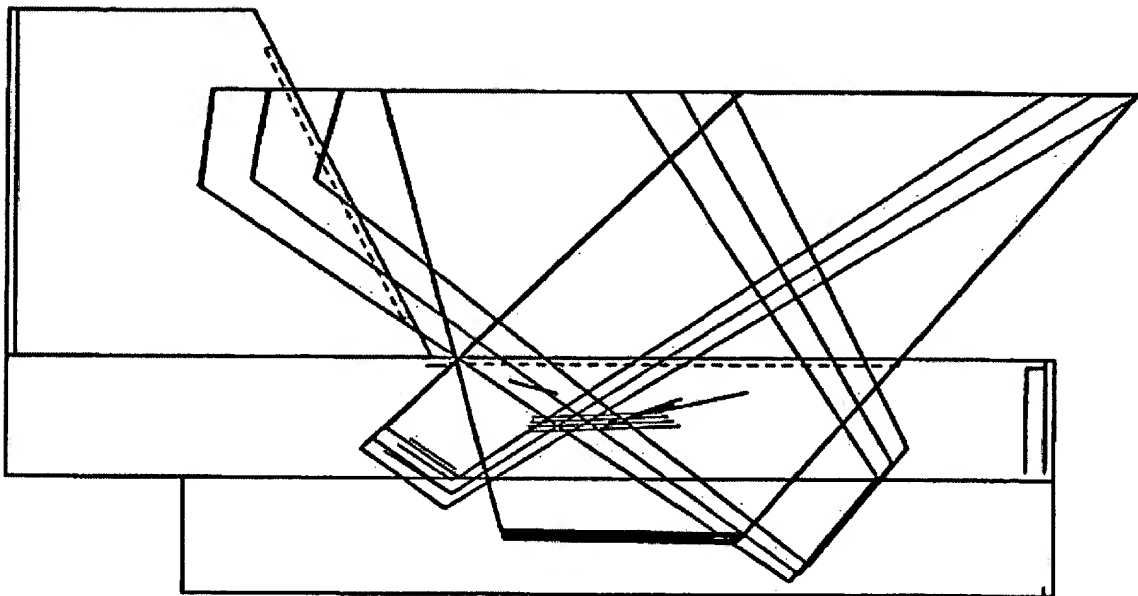
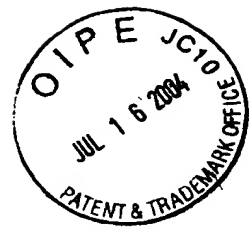


FIG. 5H5

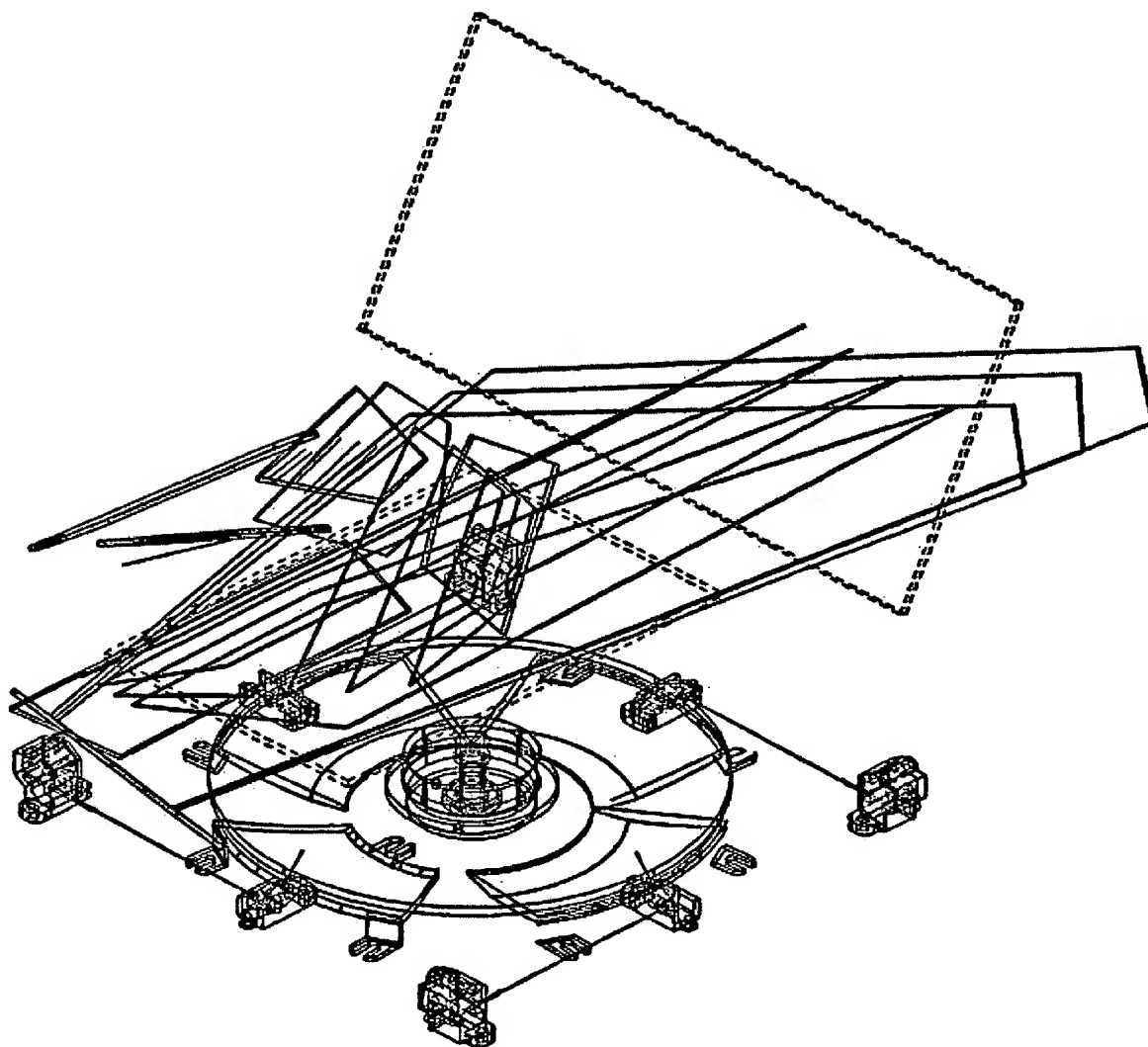
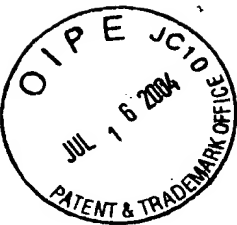


FIG. 5H6

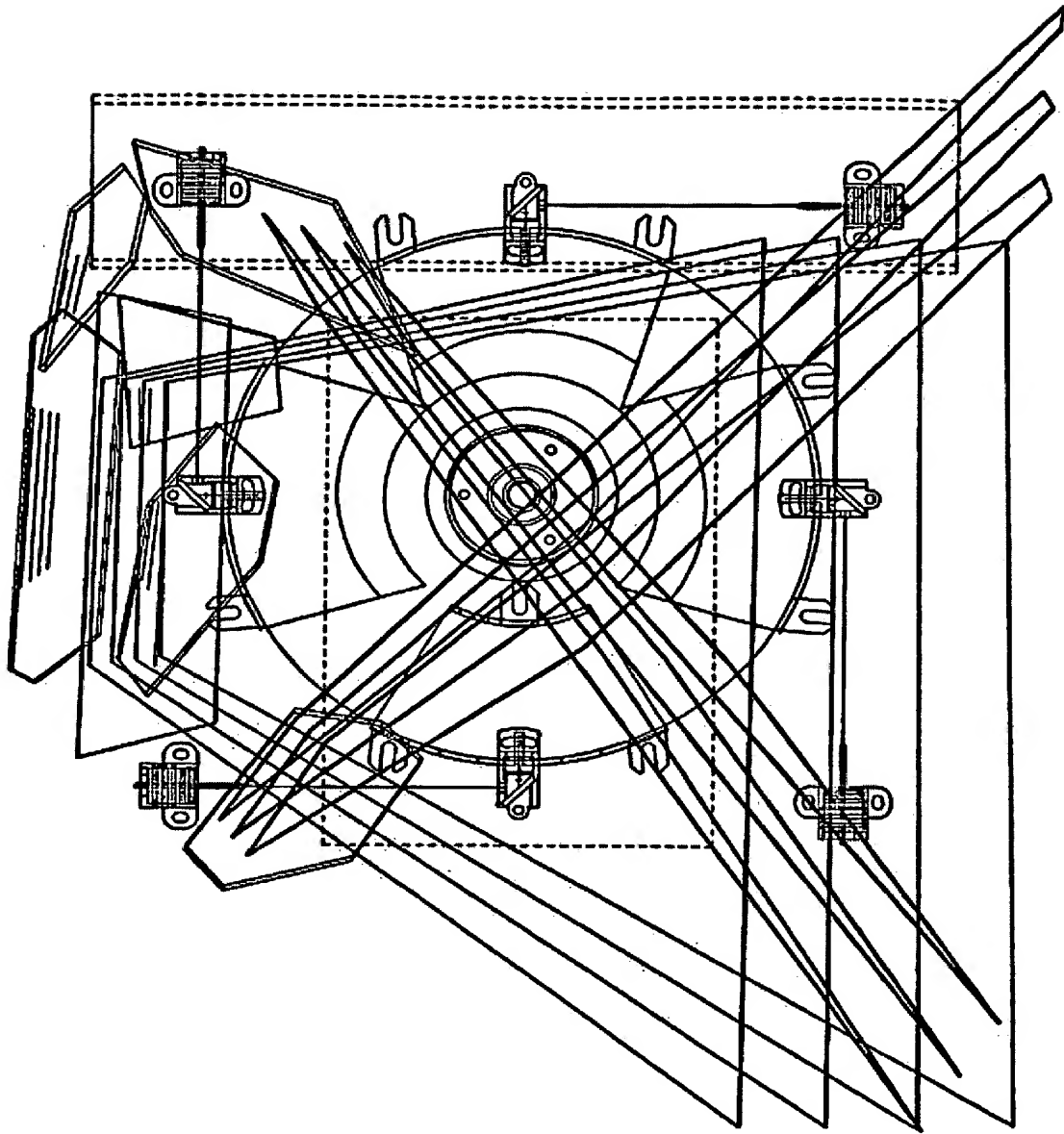


FIG. 5H7

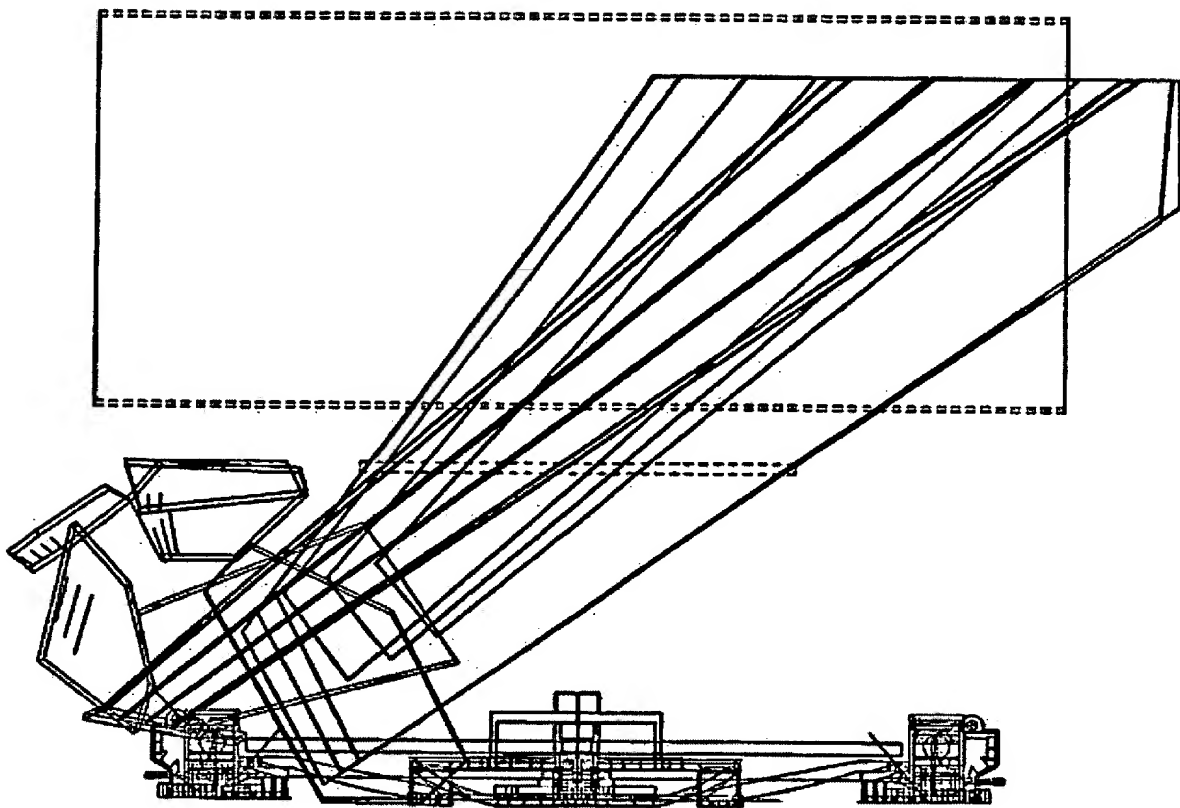
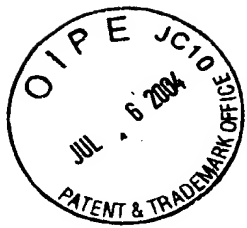


FIG. 5H8

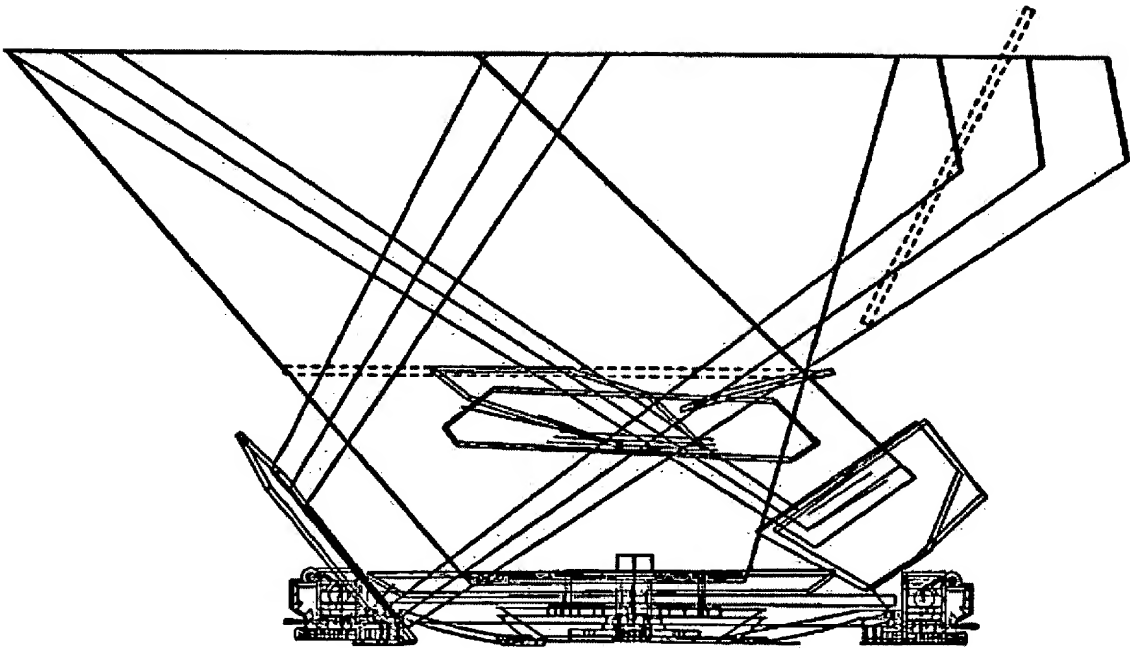
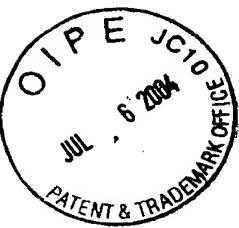


FIG. 5H9

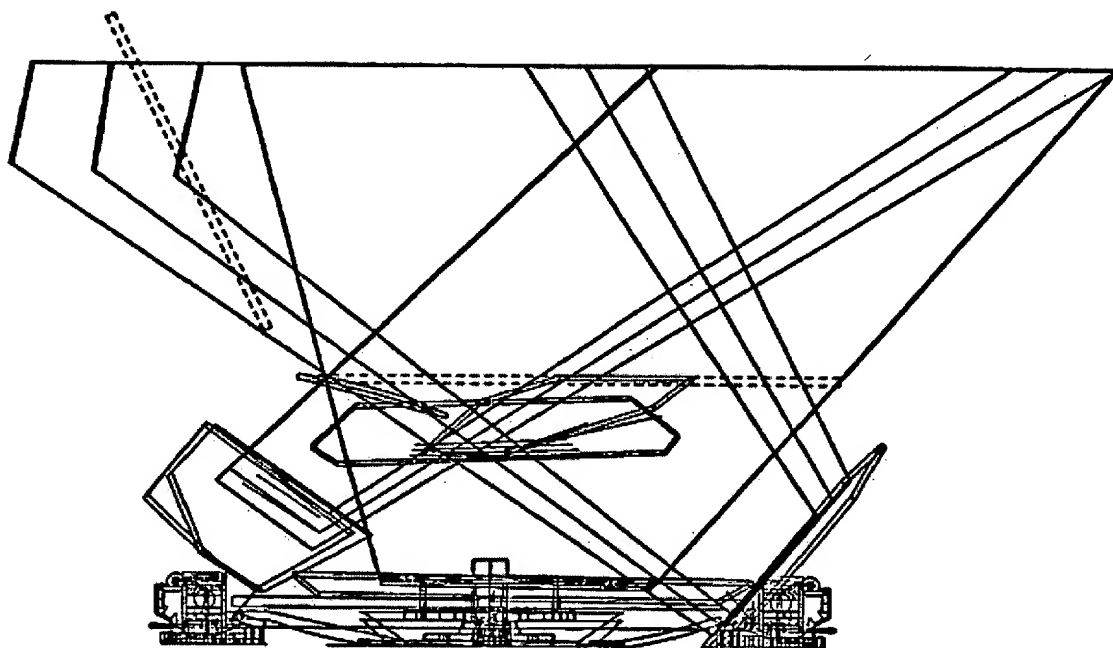
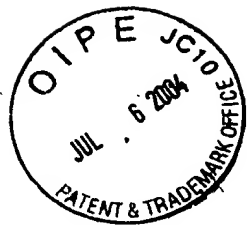


FIG. 5H10

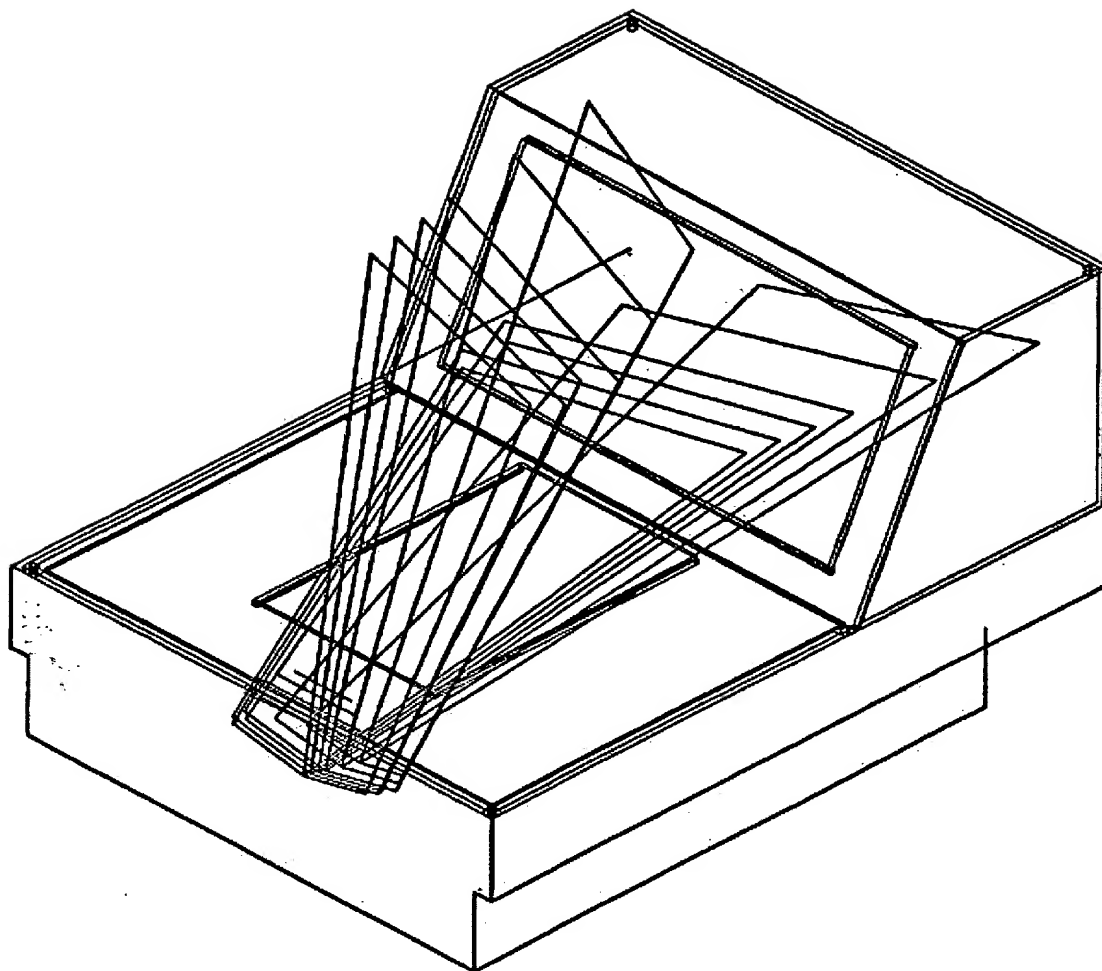
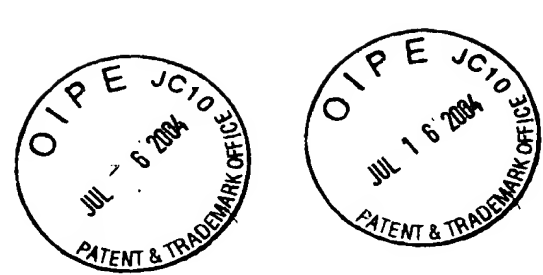


FIG. 511

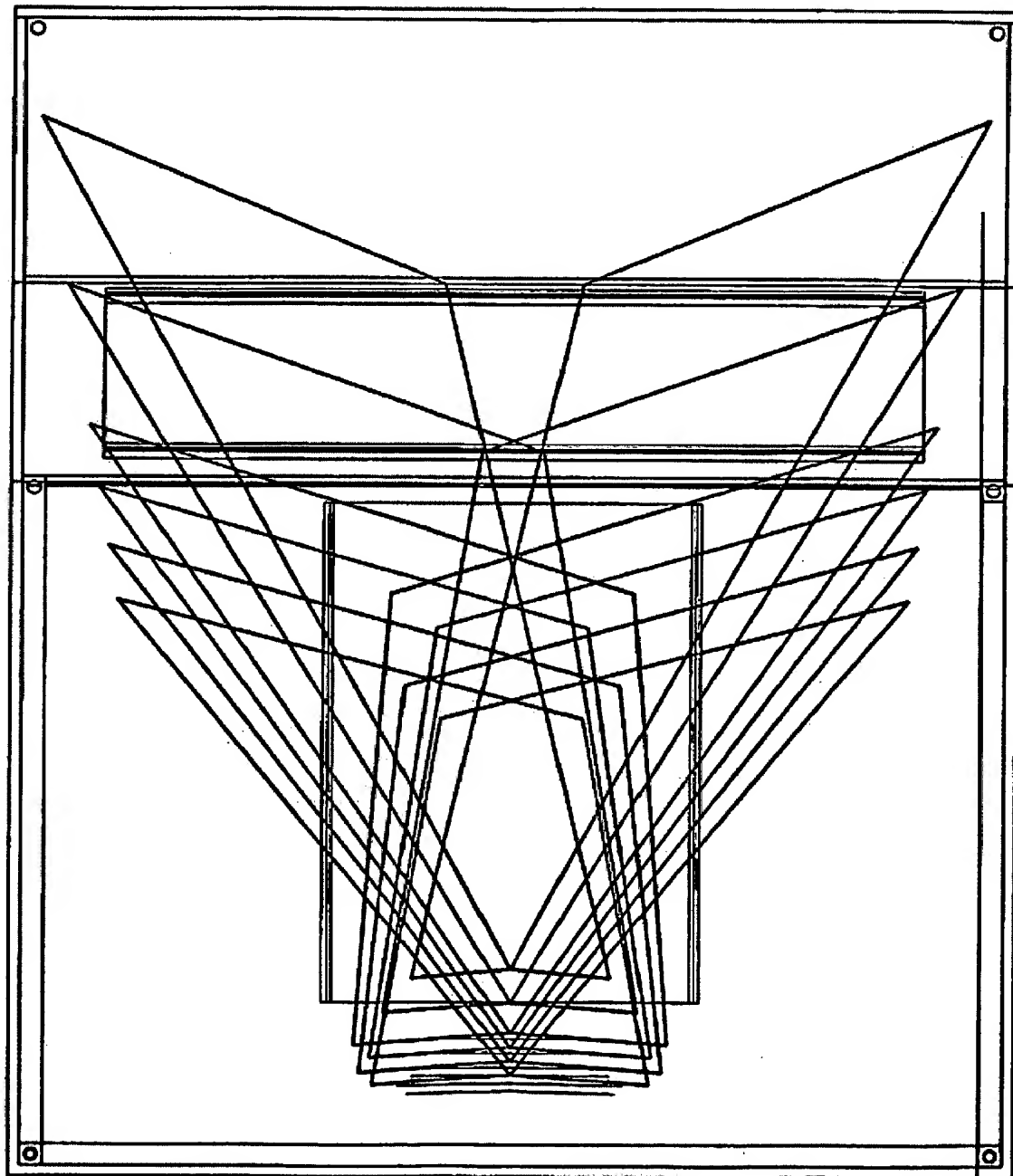
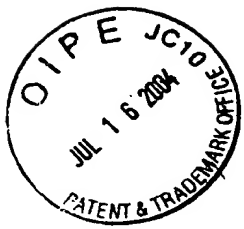


FIG. 512

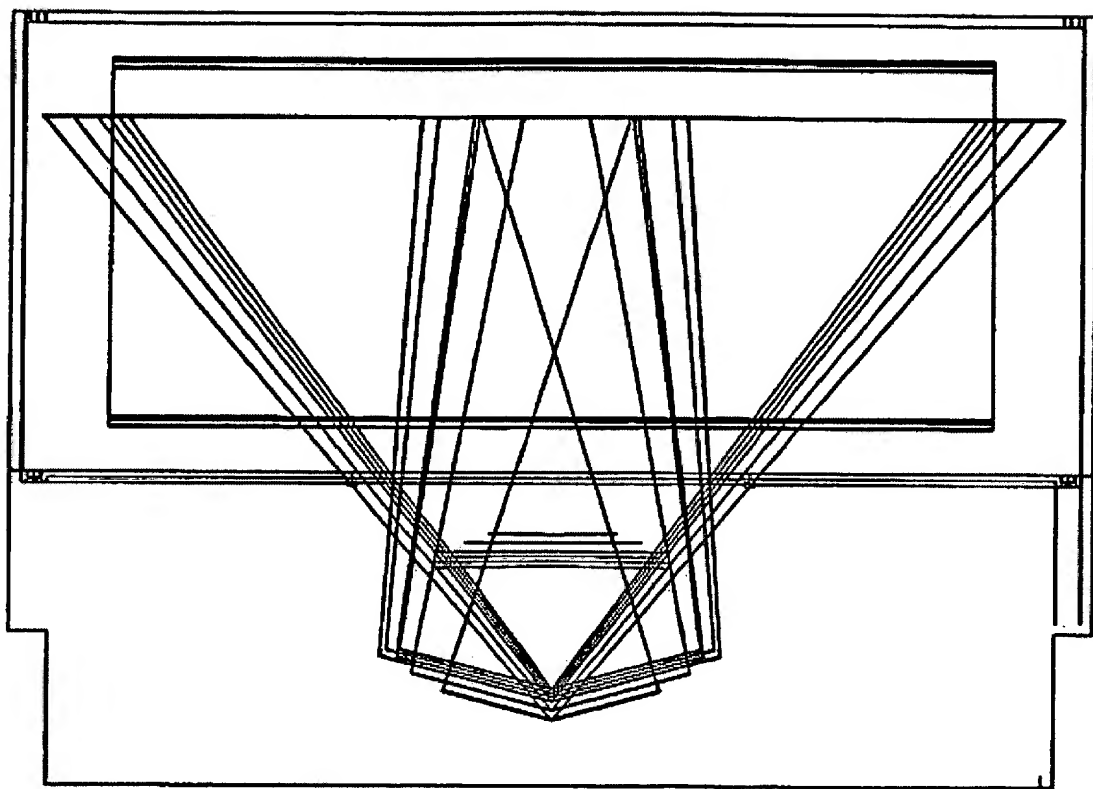
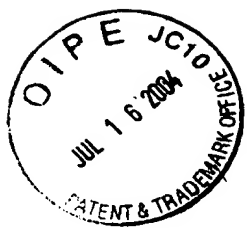


FIG. 513

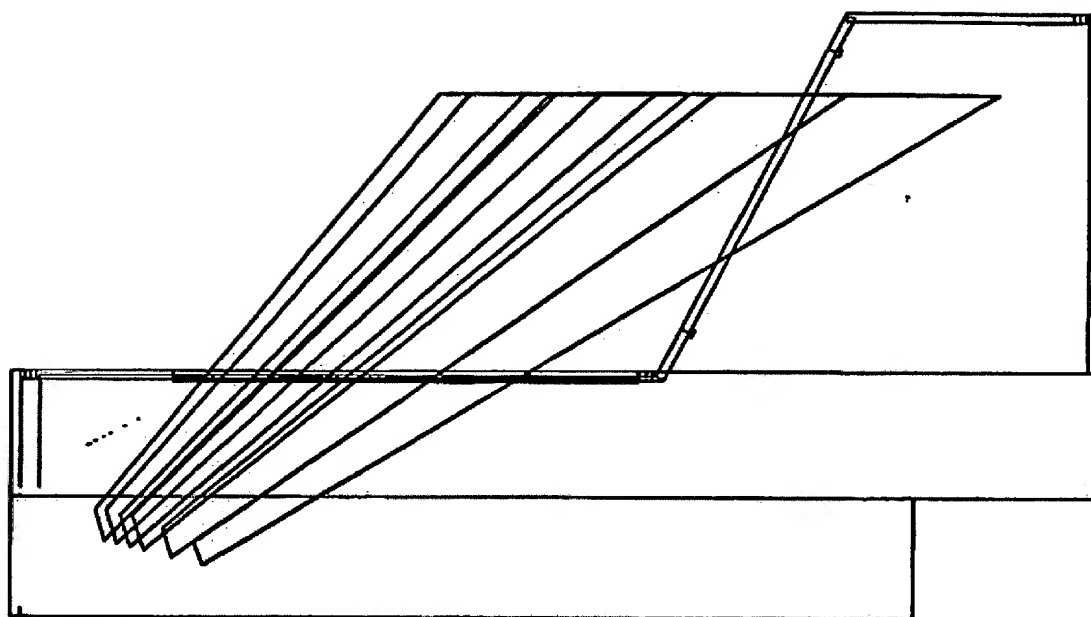
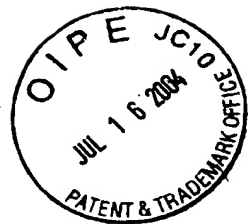


FIG. 514

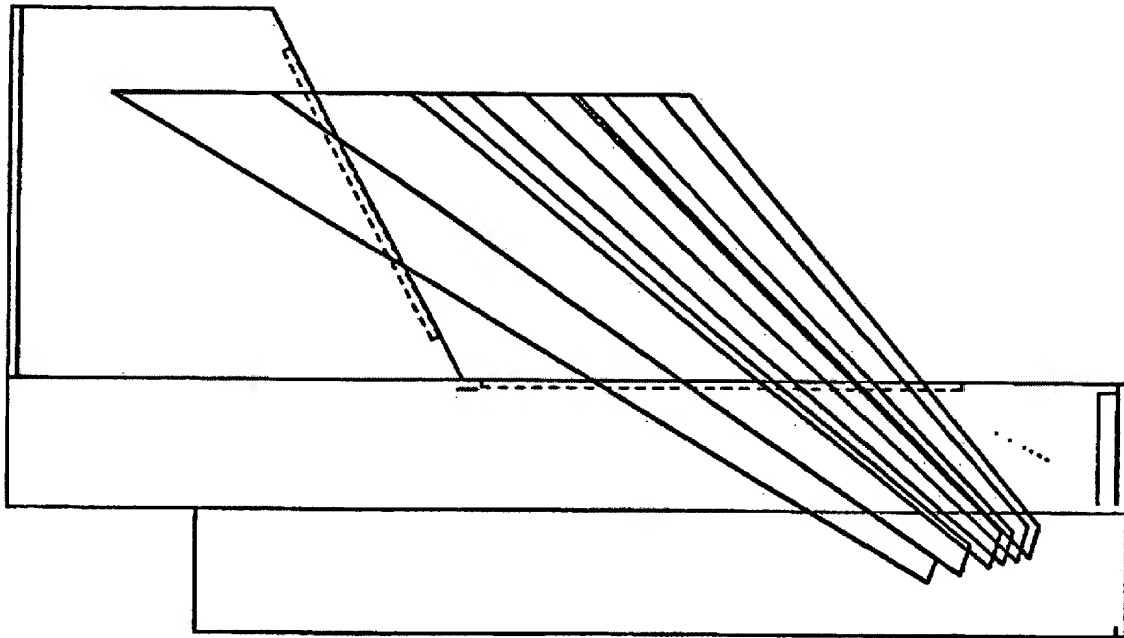
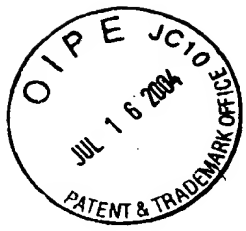


FIG. 515

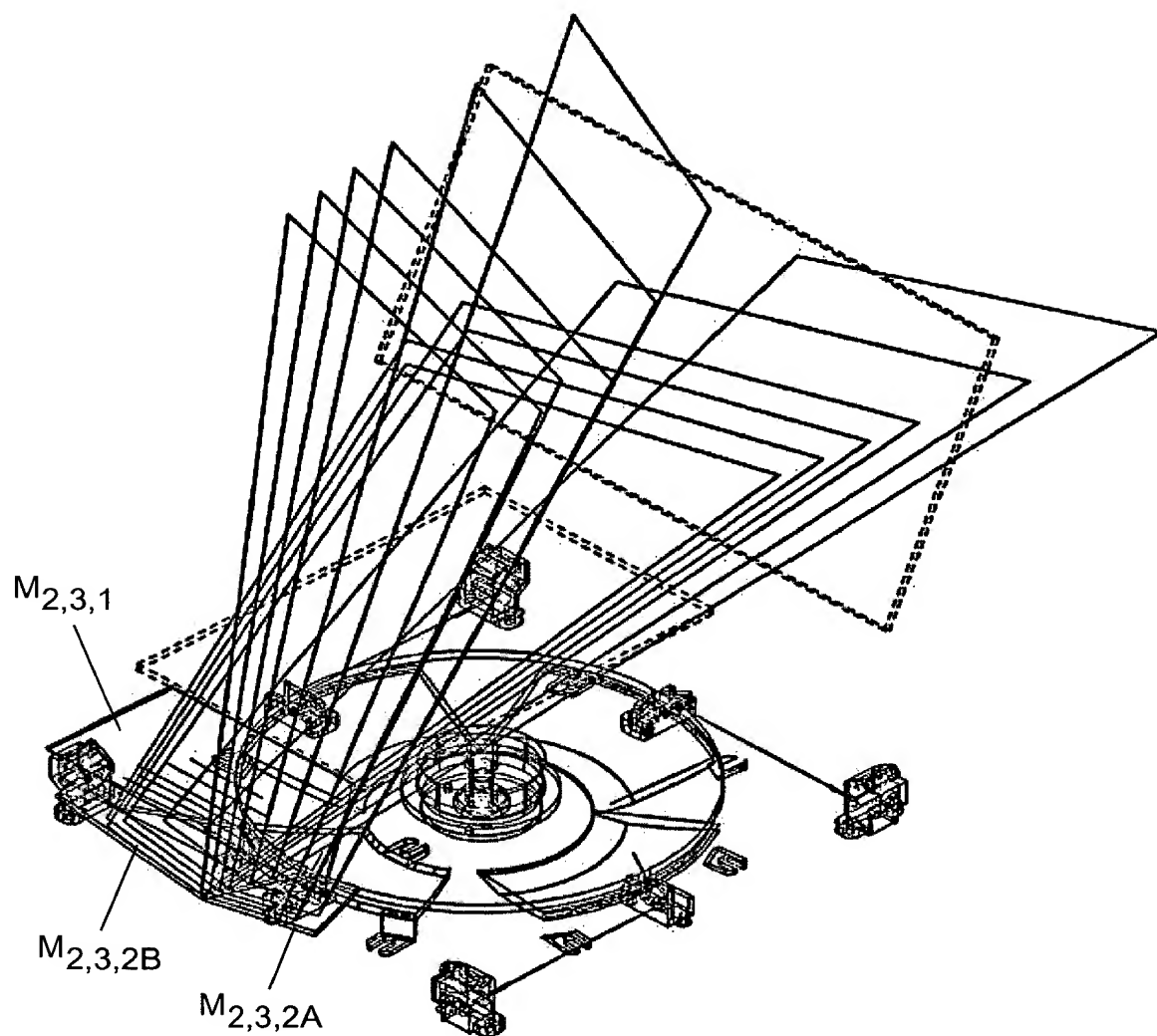


FIG. 5J1

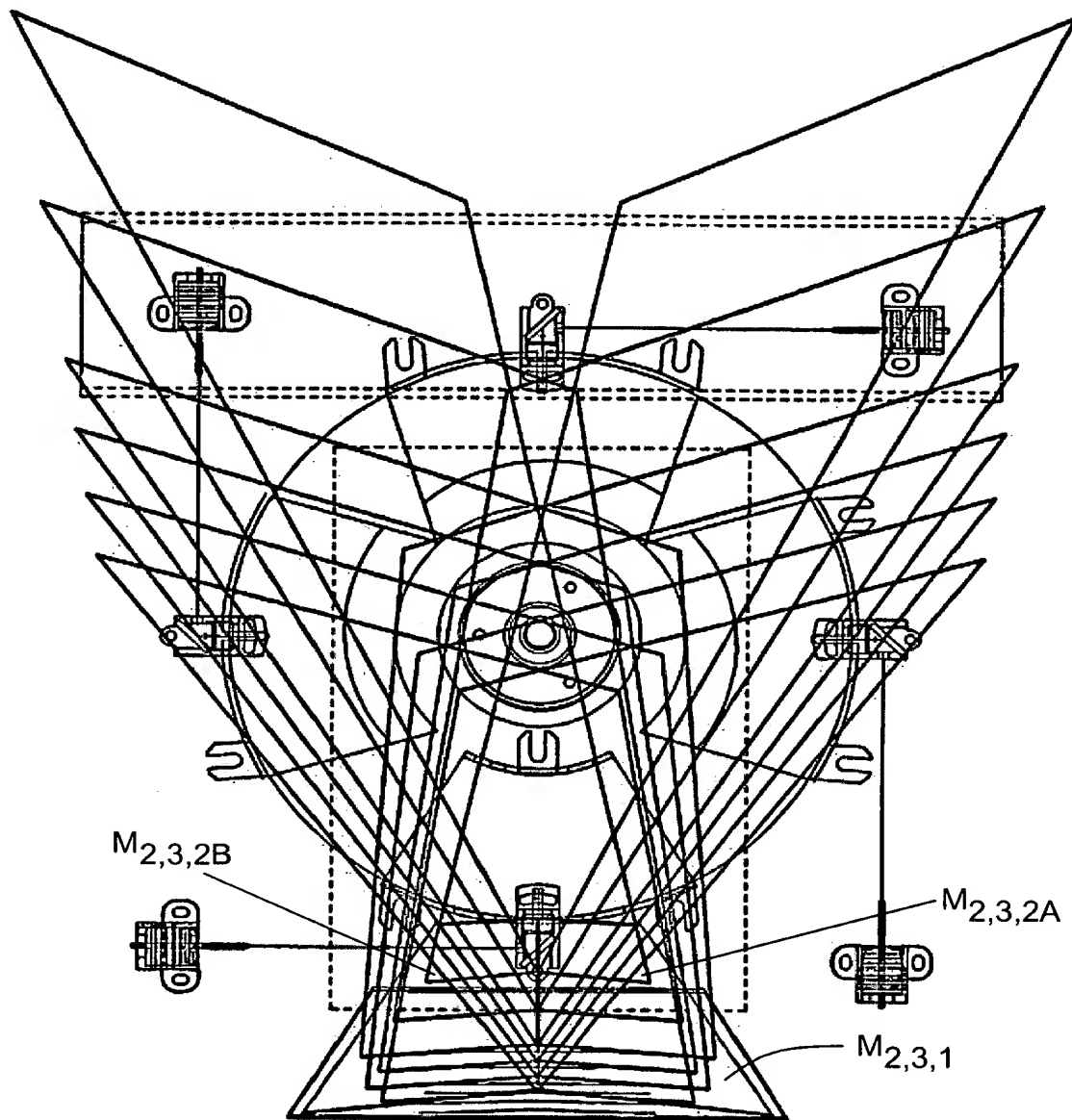


FIG. 5J2

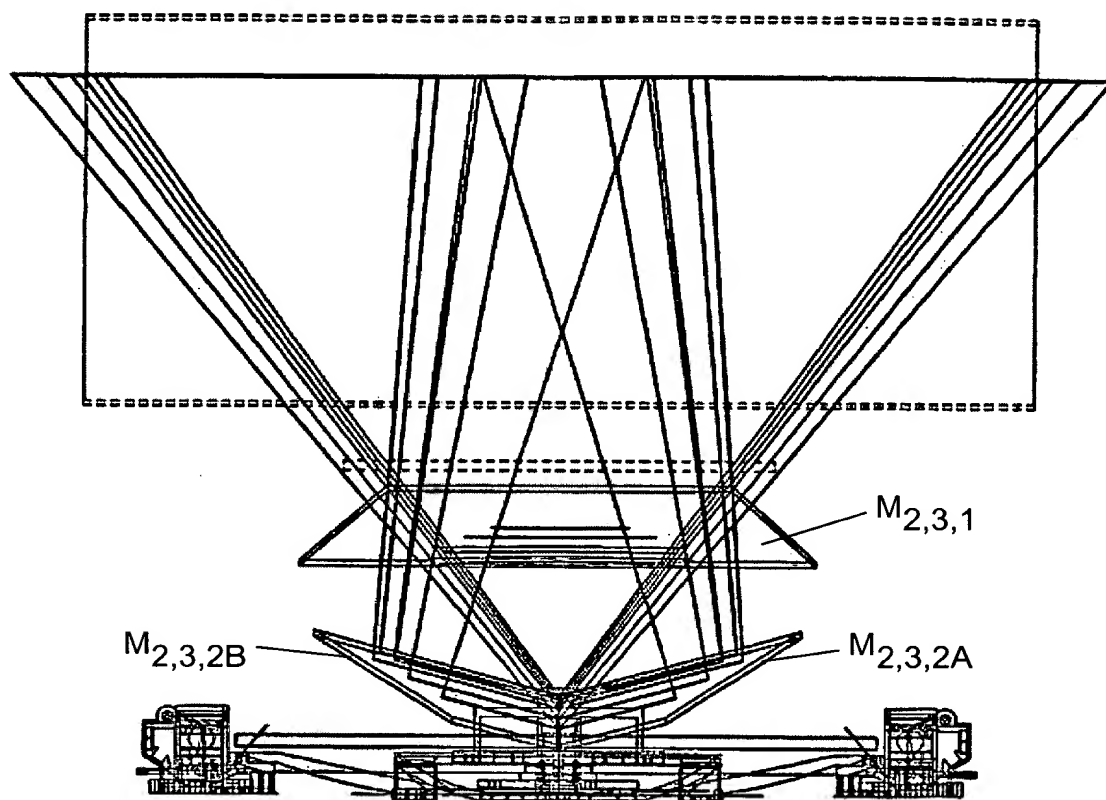
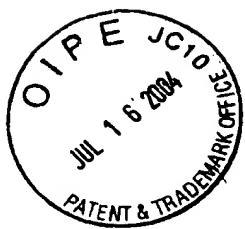


FIG. 5J3

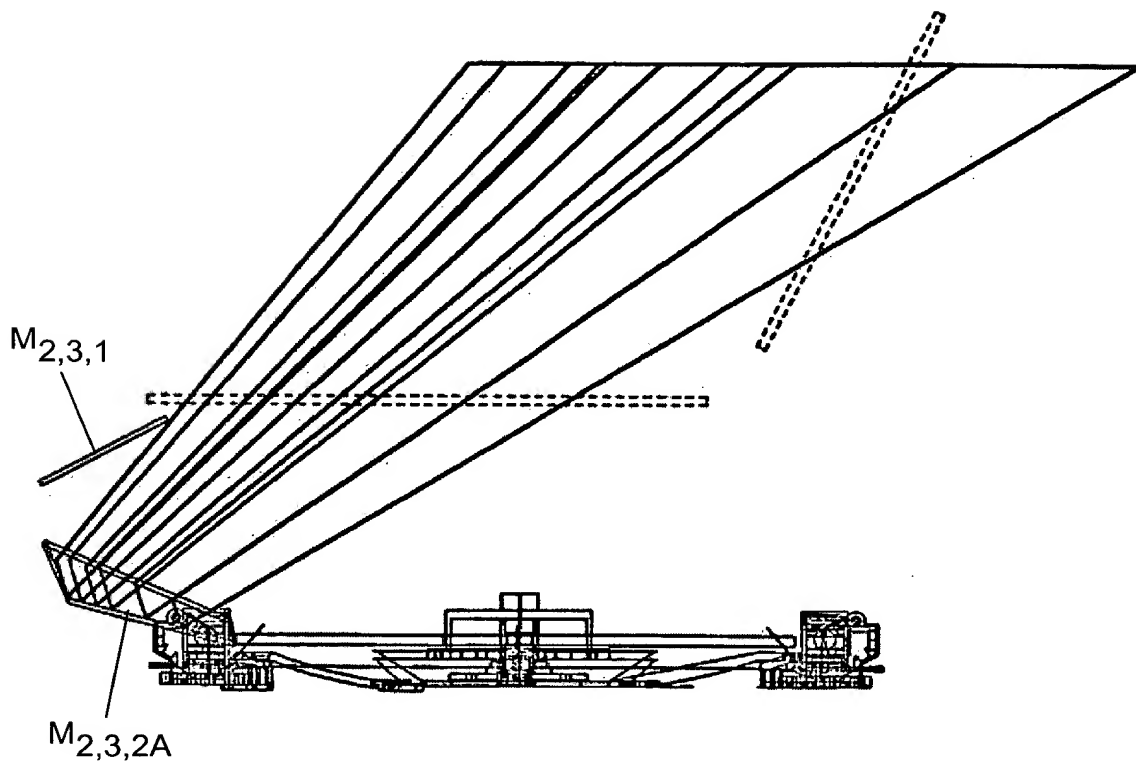
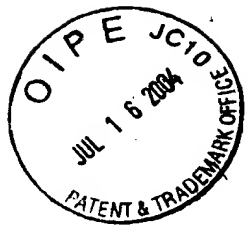


FIG. 5J4

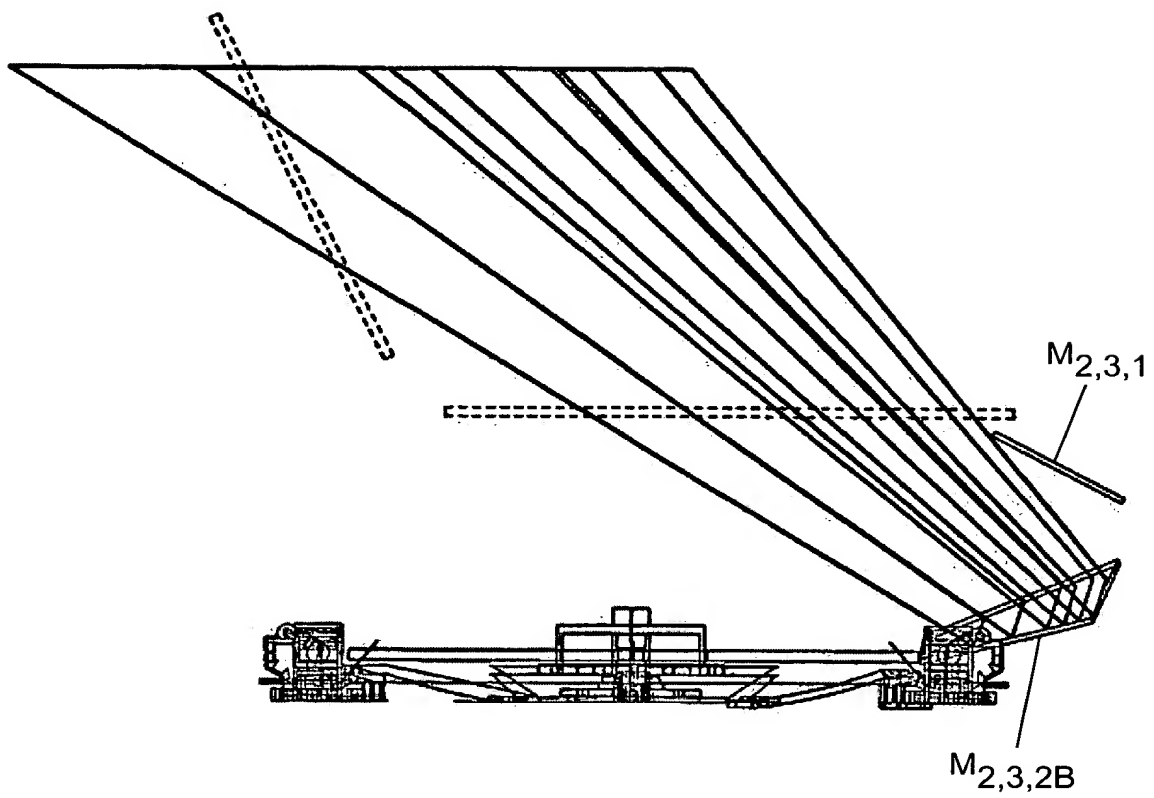


FIG. 5J5

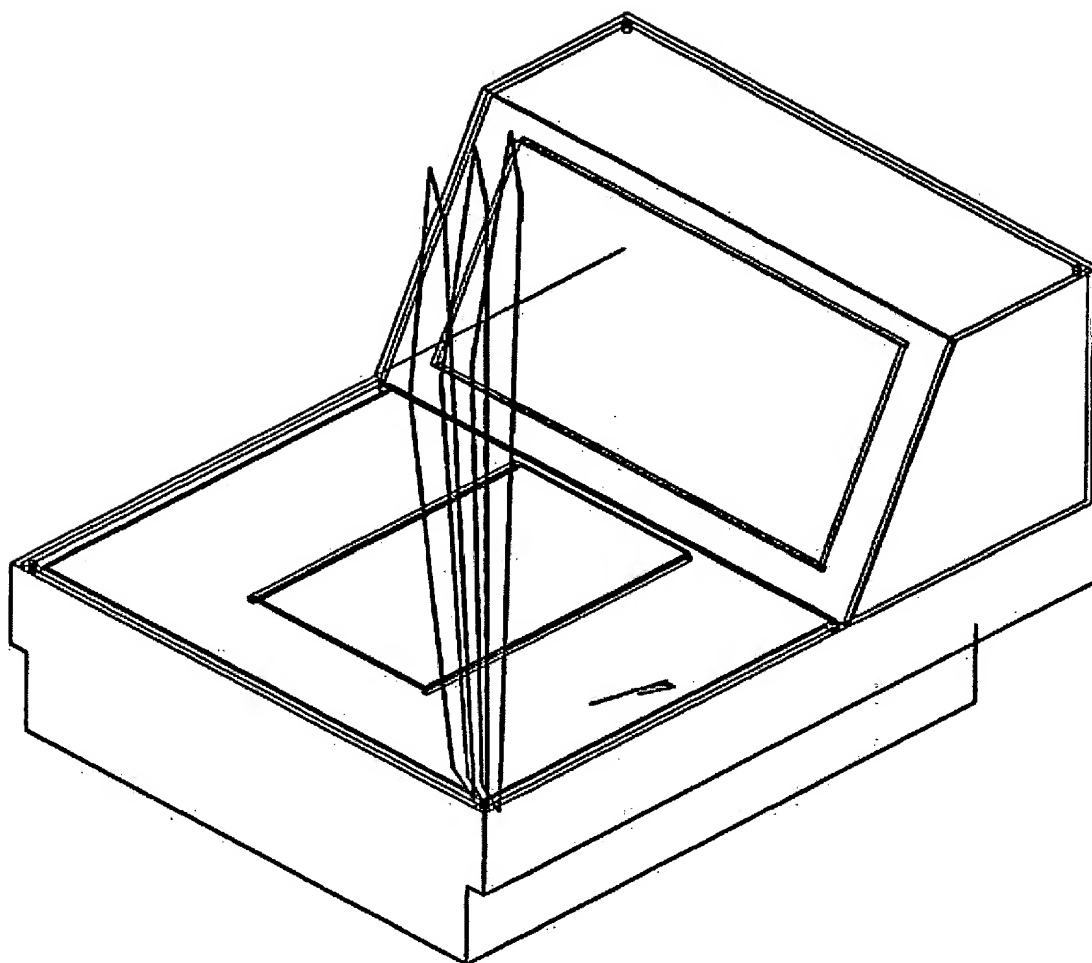
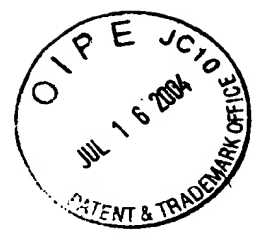


FIG. 5K1

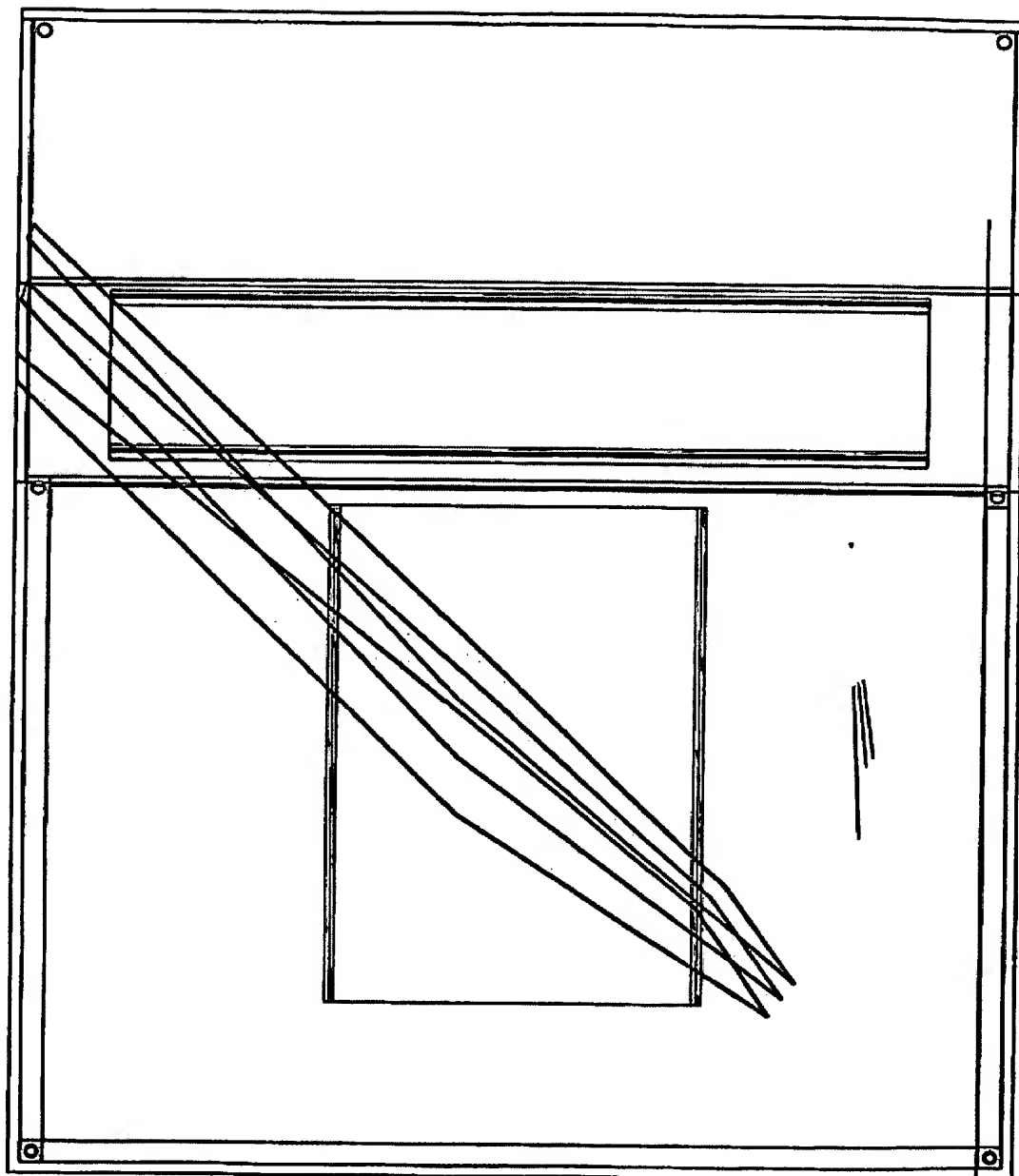
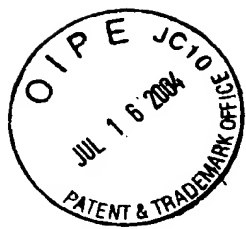


FIG. 5K2

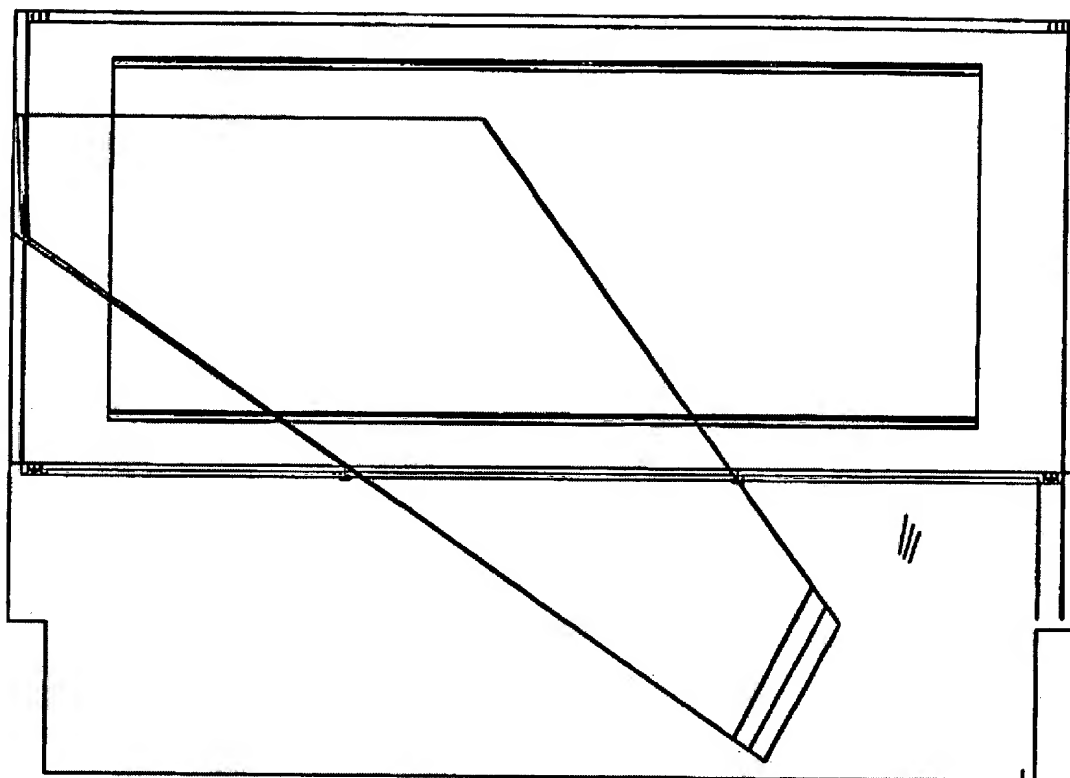
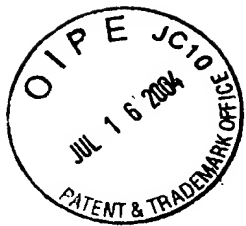


FIG. 5K3

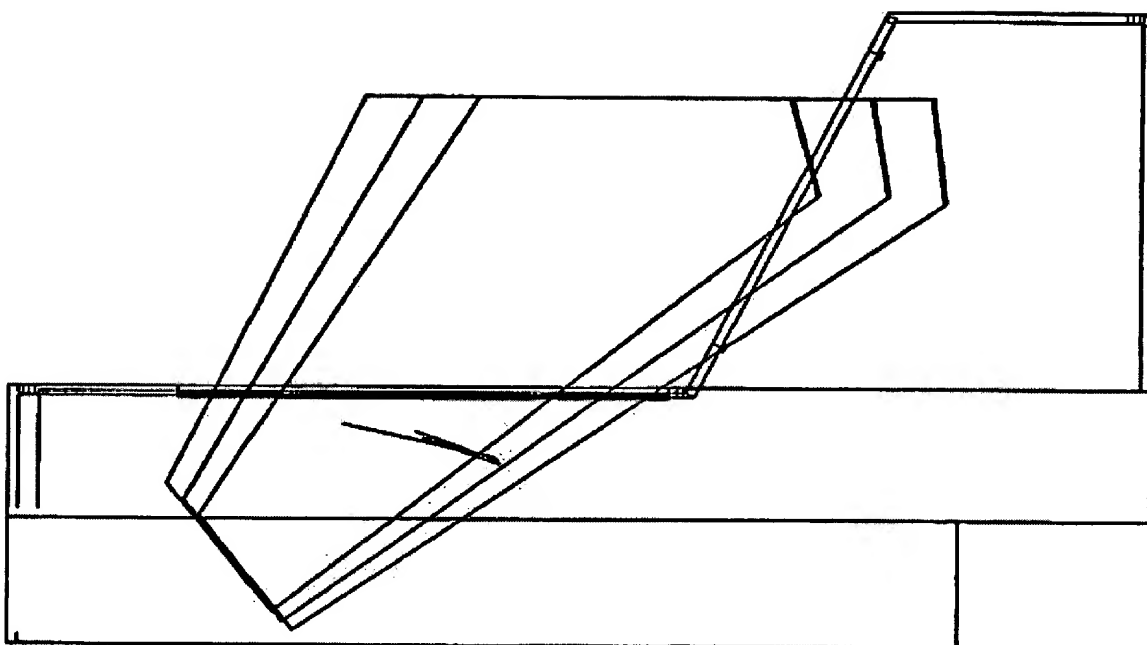
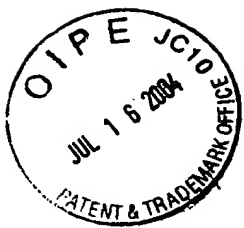


FIG. 5K4

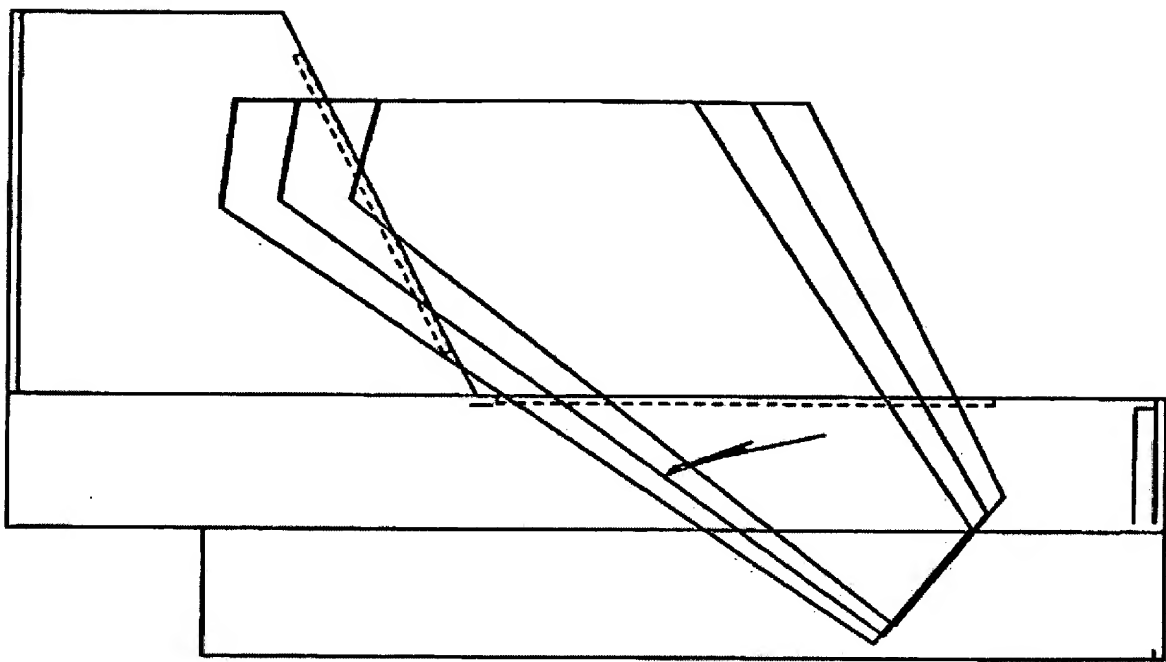
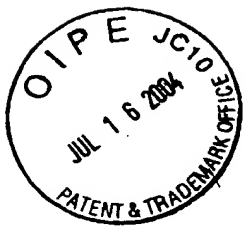


FIG. 5K5

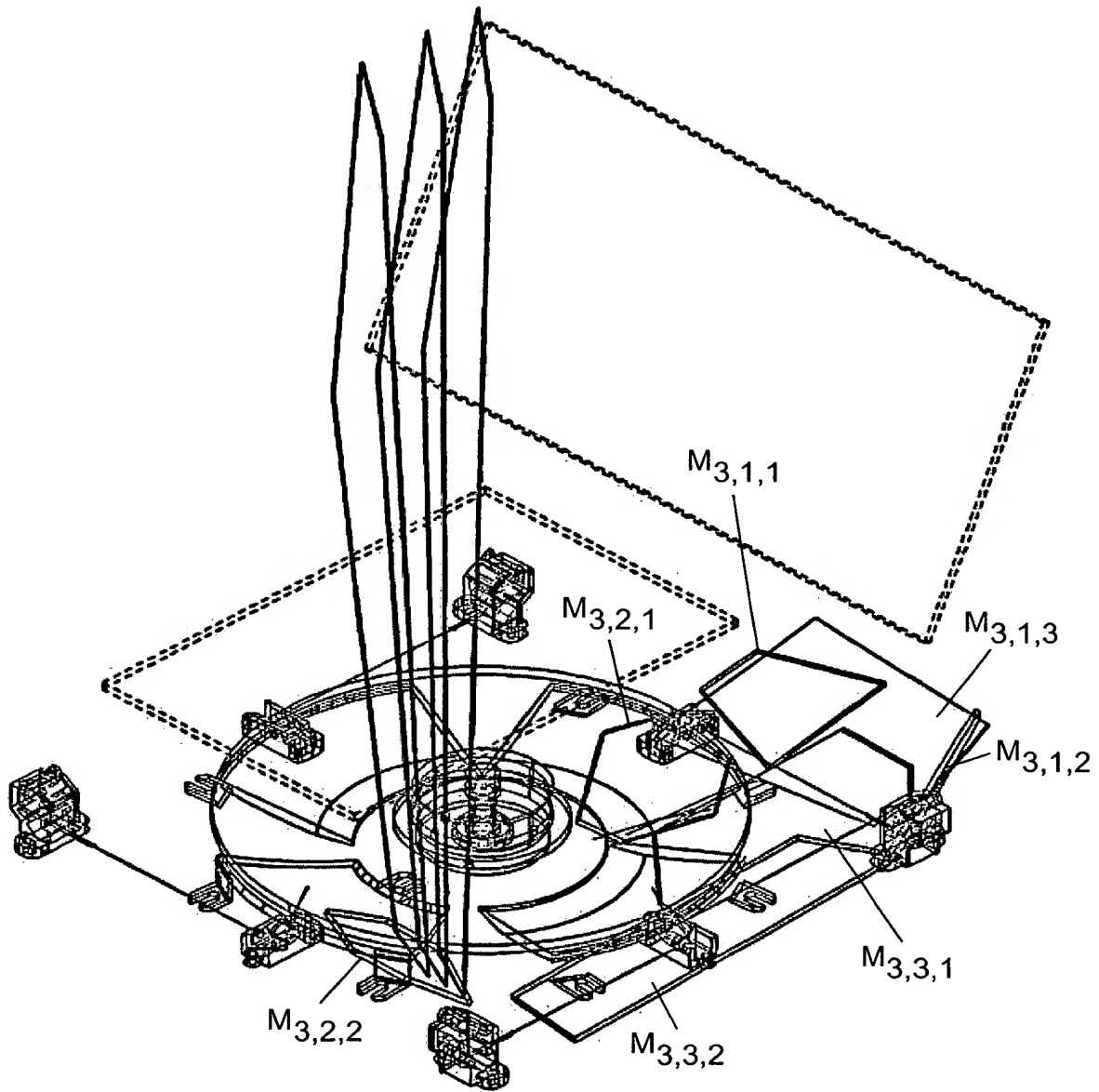
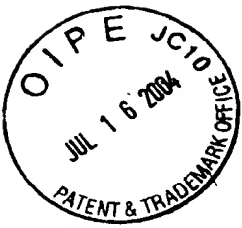


FIG. 5L1

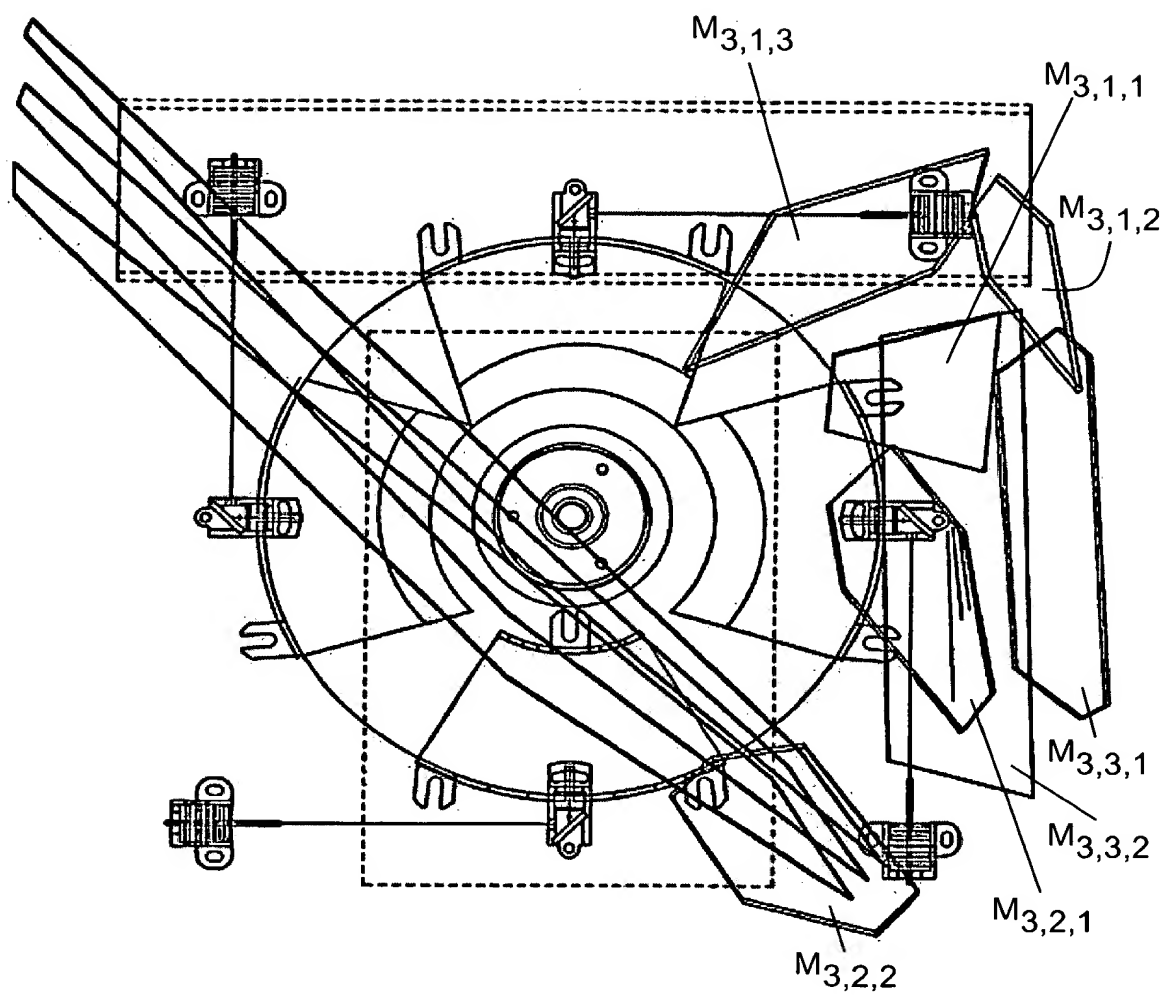
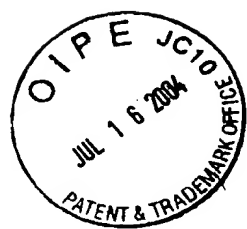


FIG. 5L2

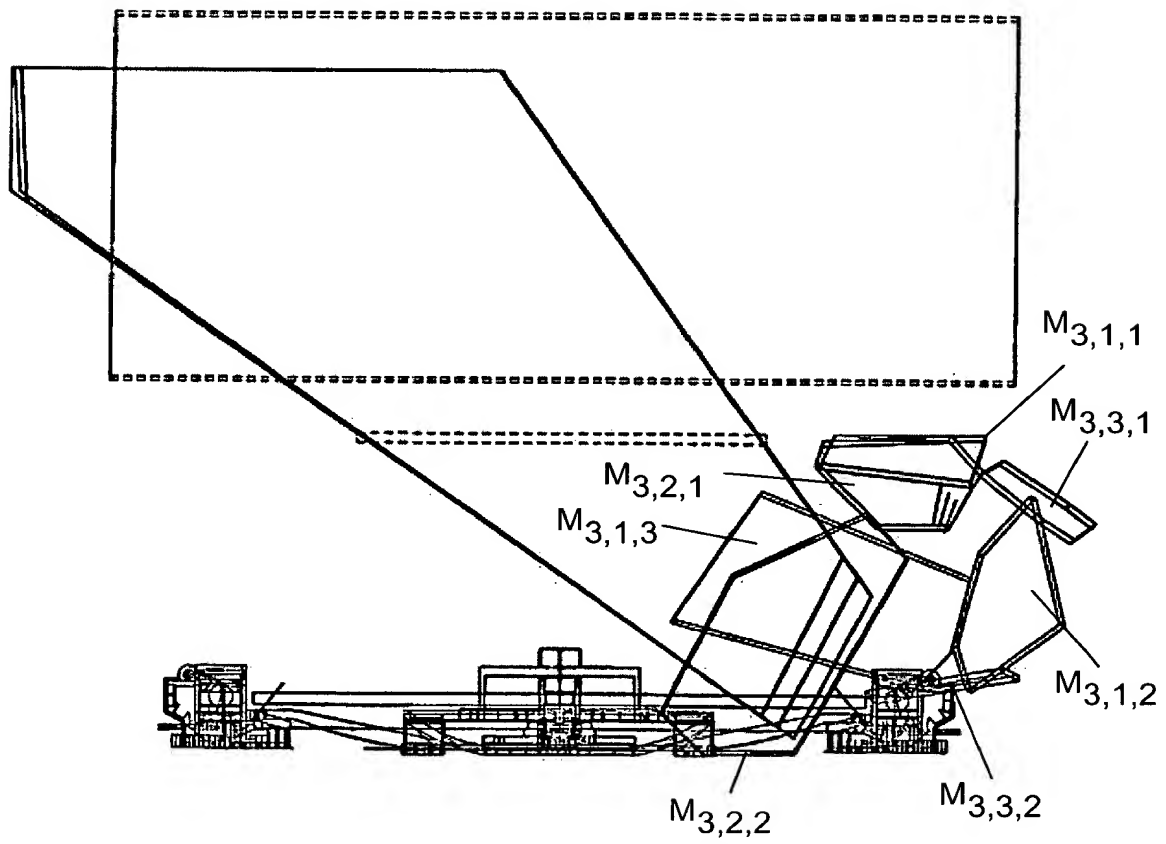


FIG. 5L3

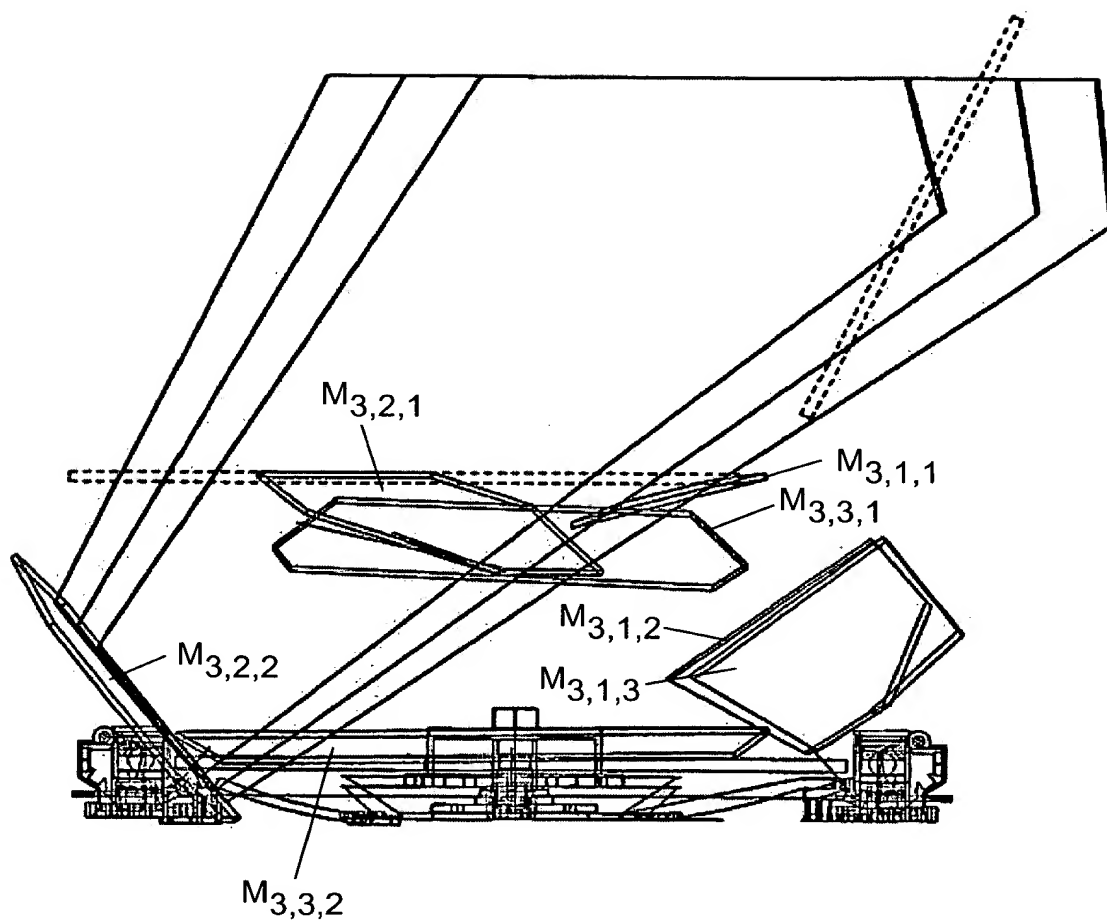


FIG. 5L4

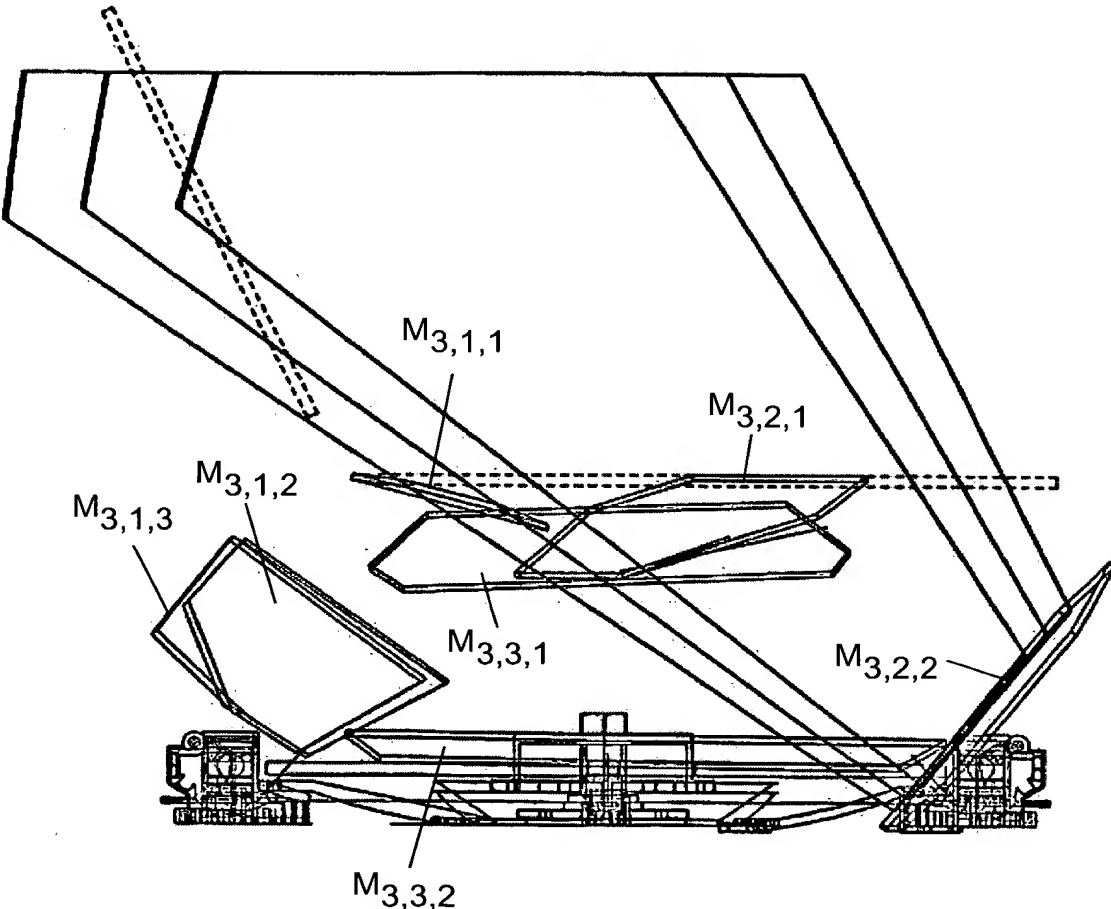
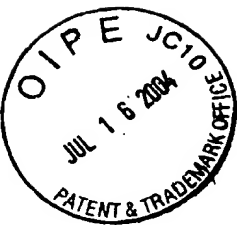


FIG. 5L5

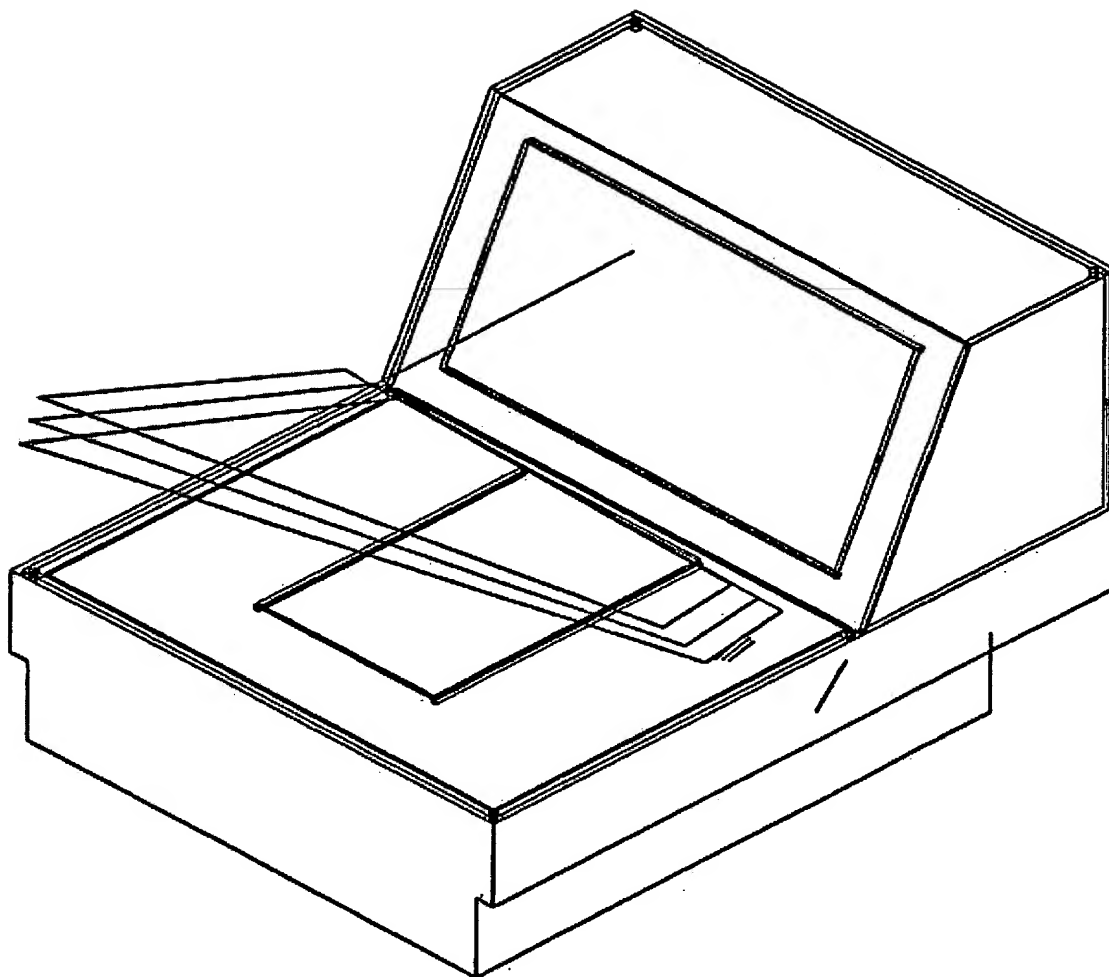
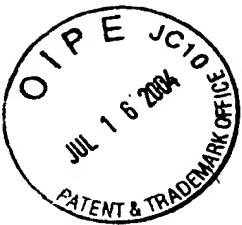


FIG. 5M1

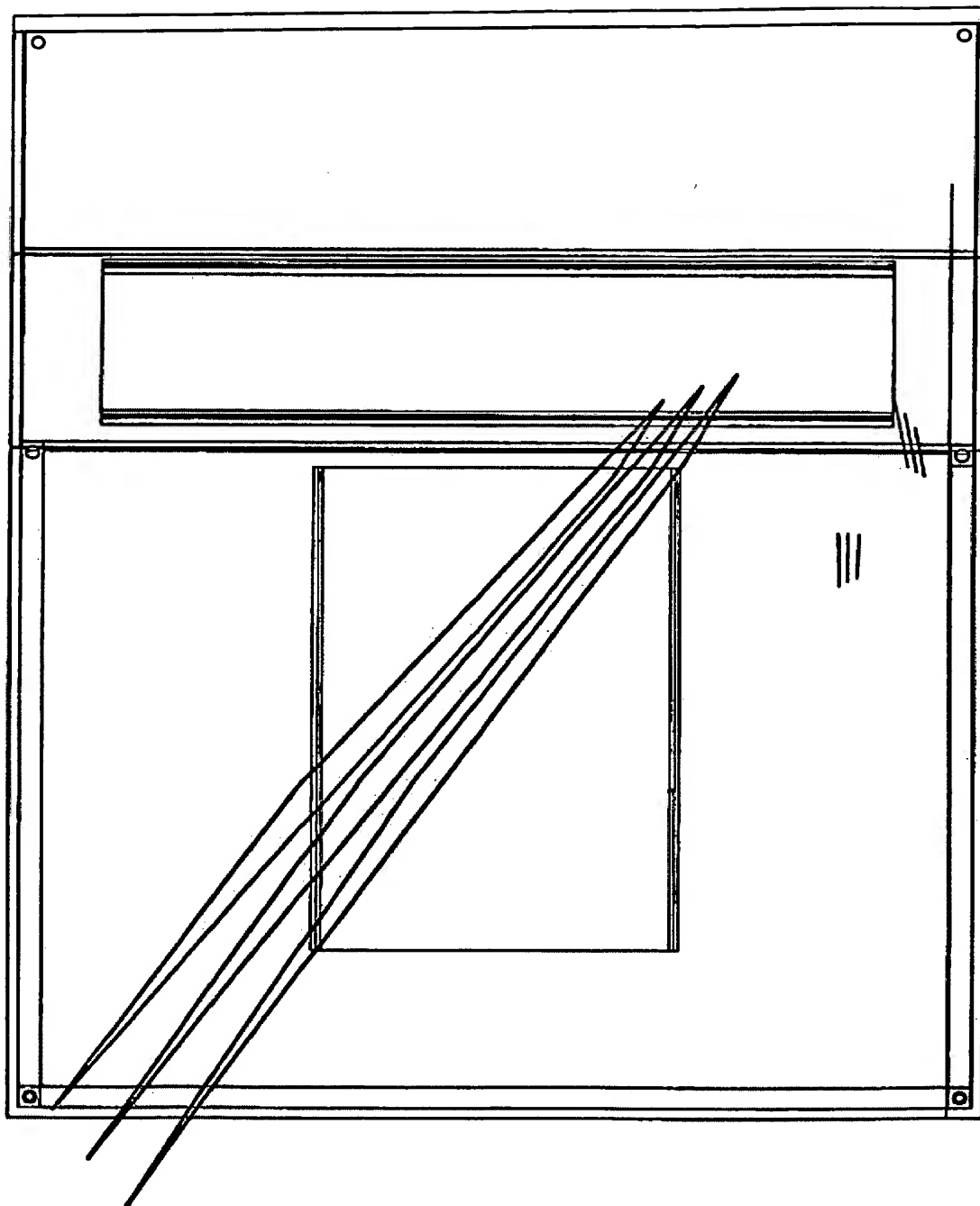
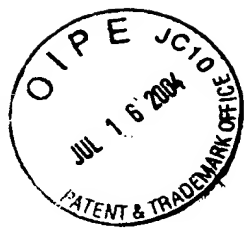


FIG. 5M2

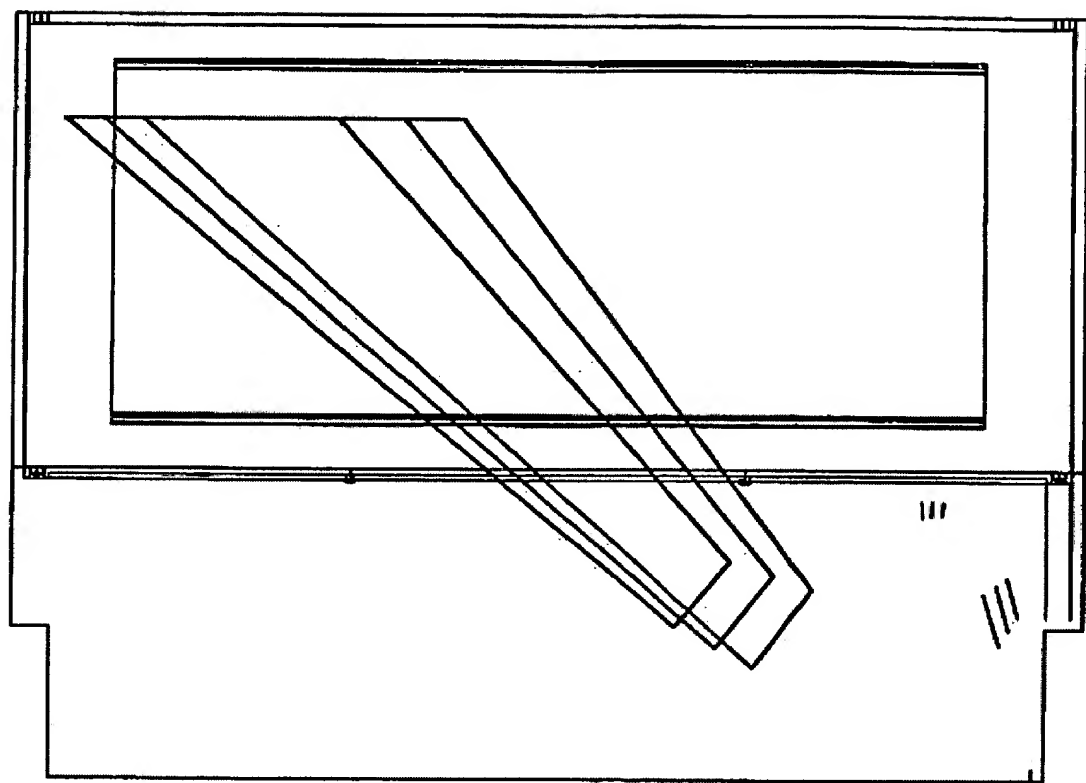


FIG. 5M3

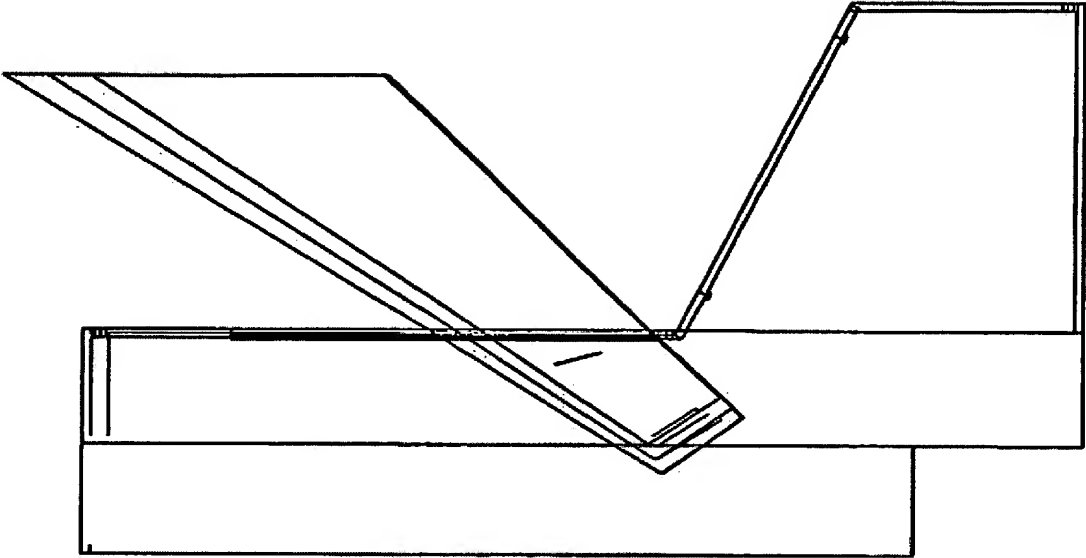
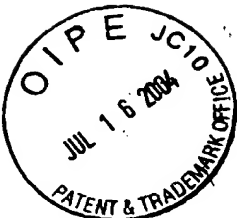


FIG. 5M4

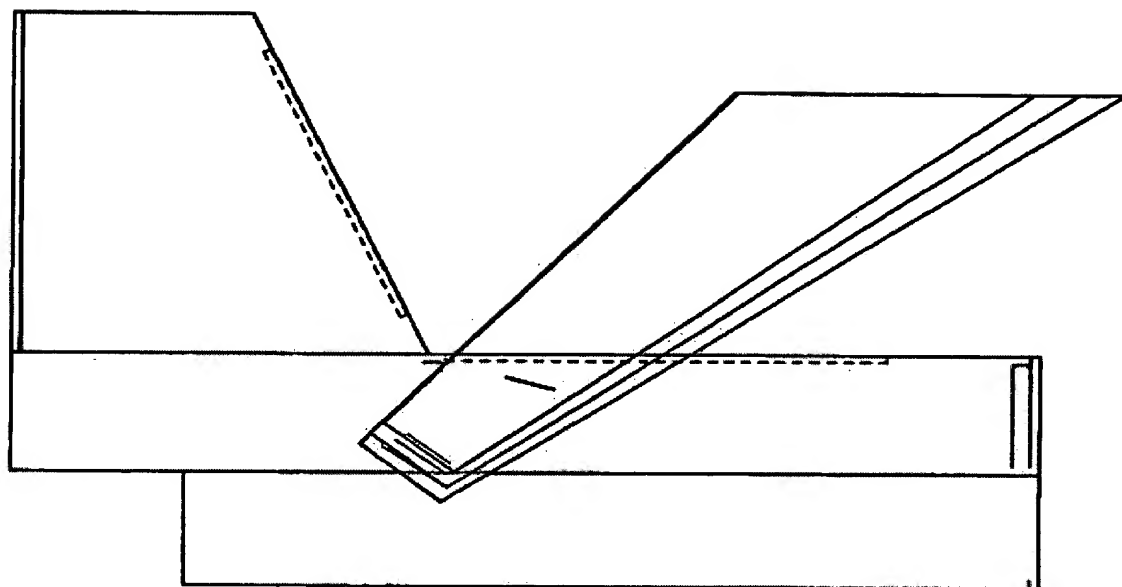
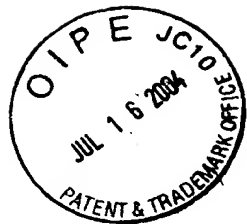


FIG. 5M5

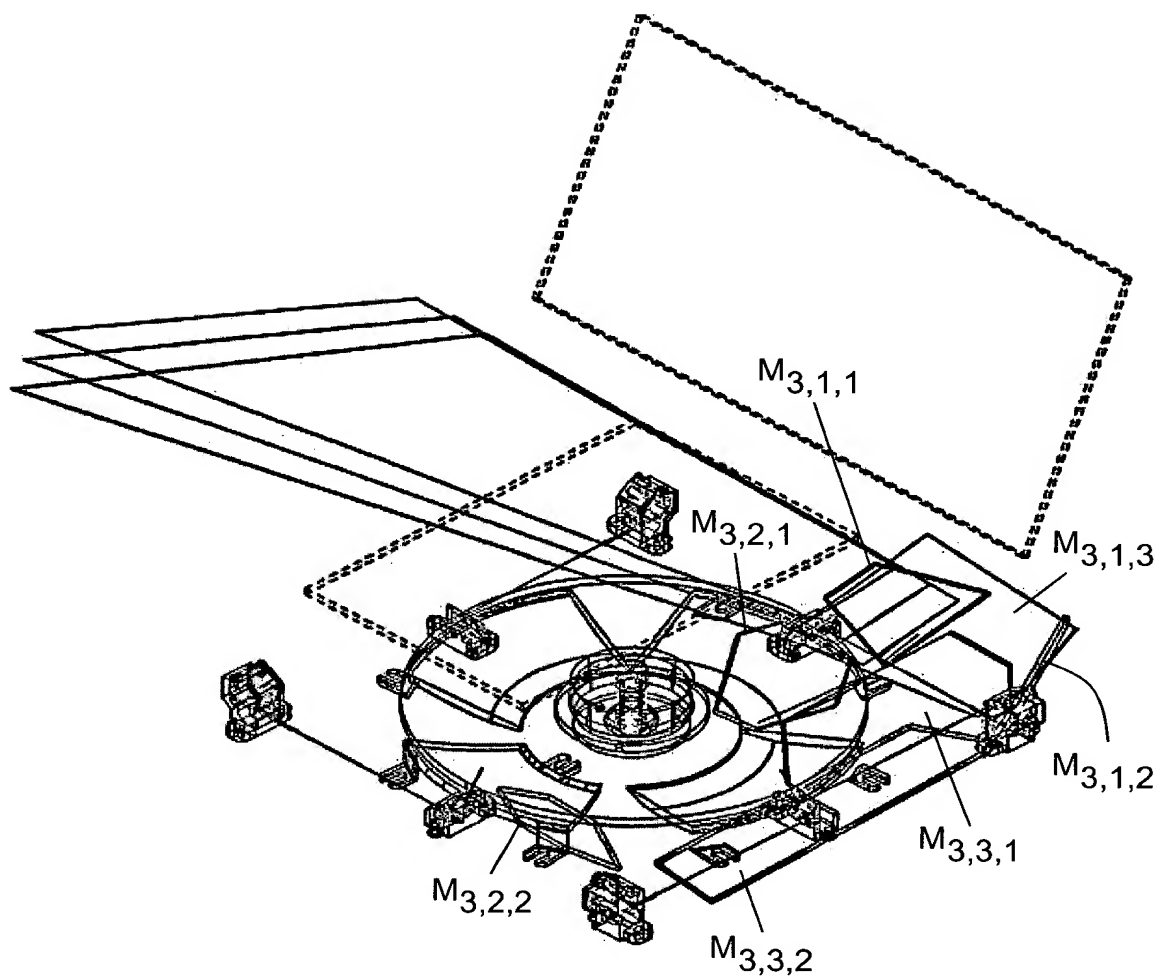


FIG. 5N1

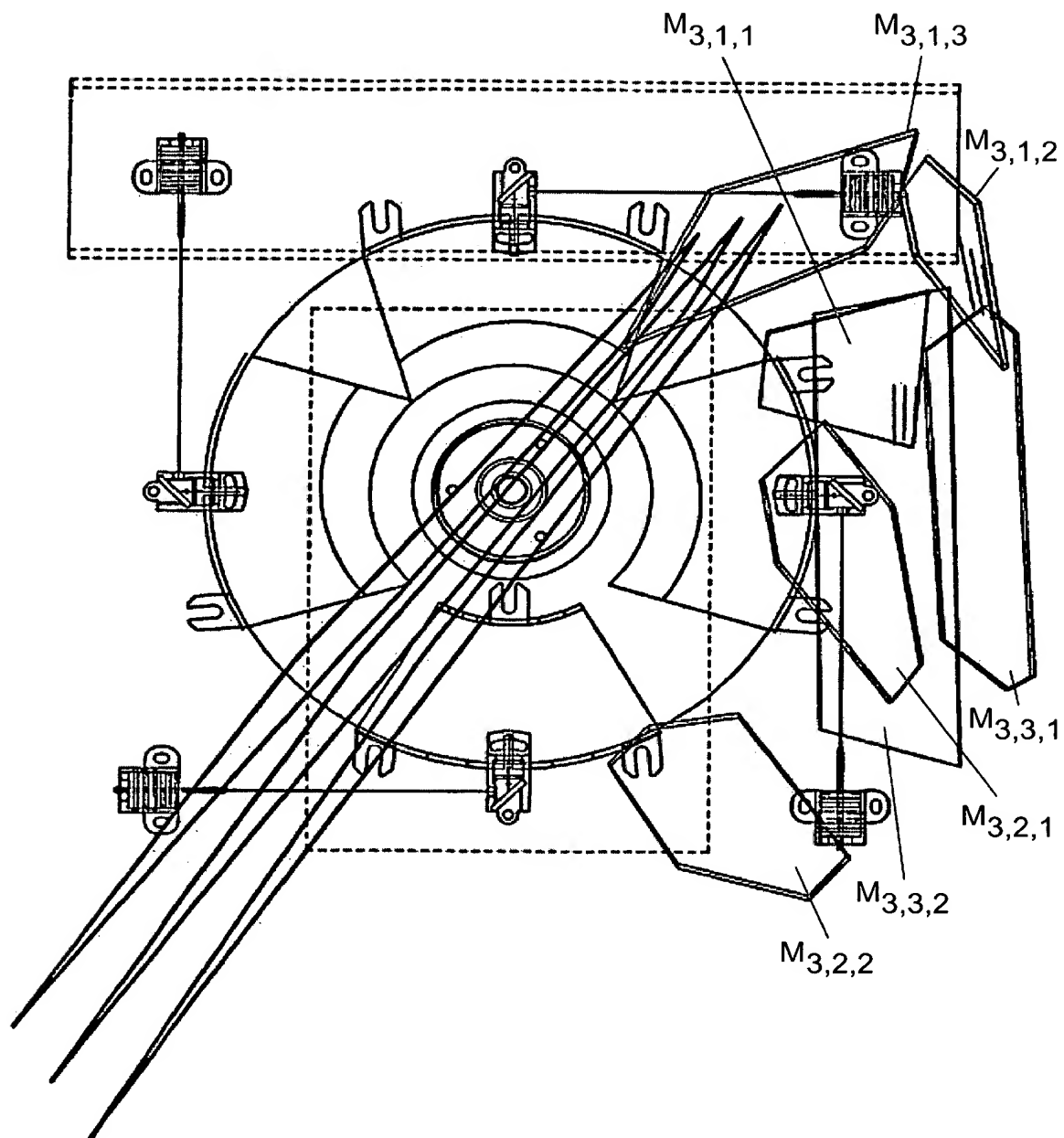


FIG. 5N2

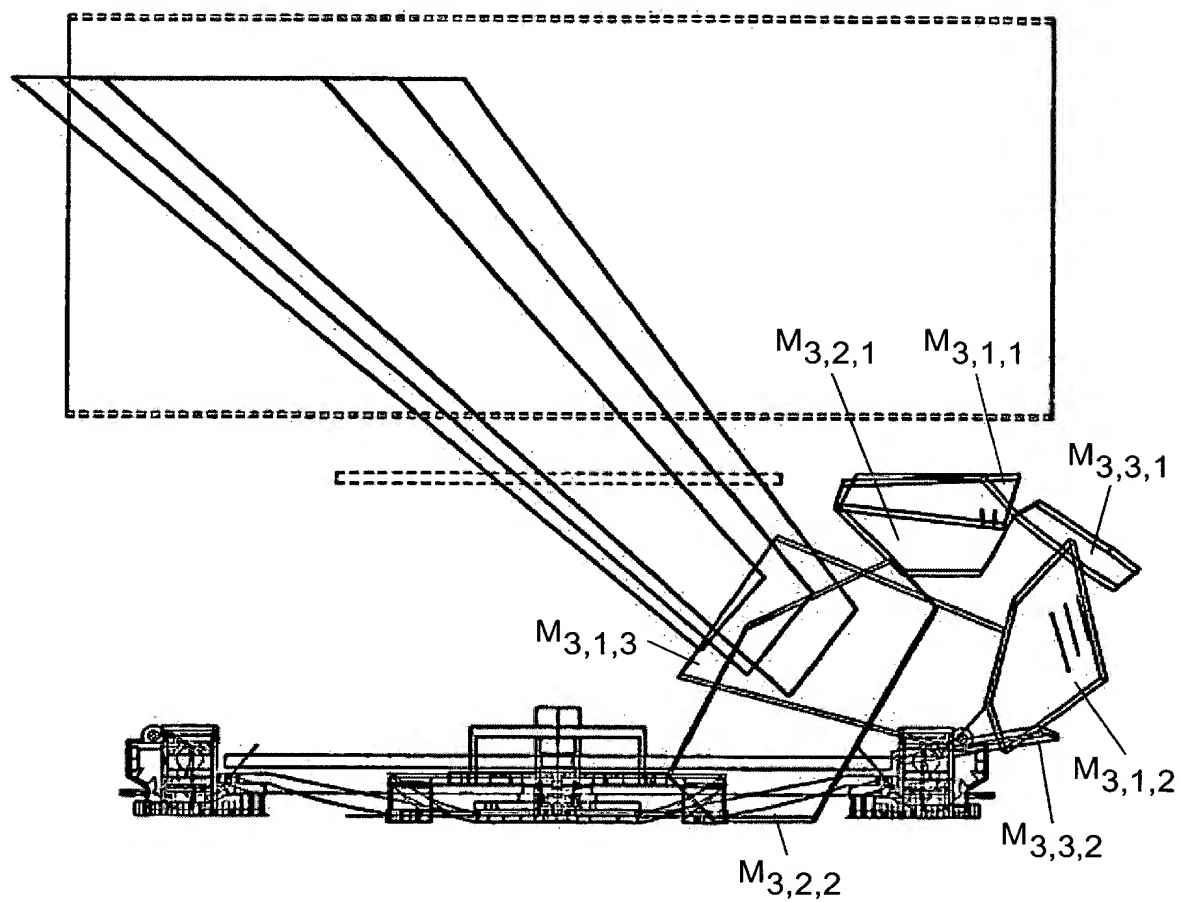


FIG. 5N3

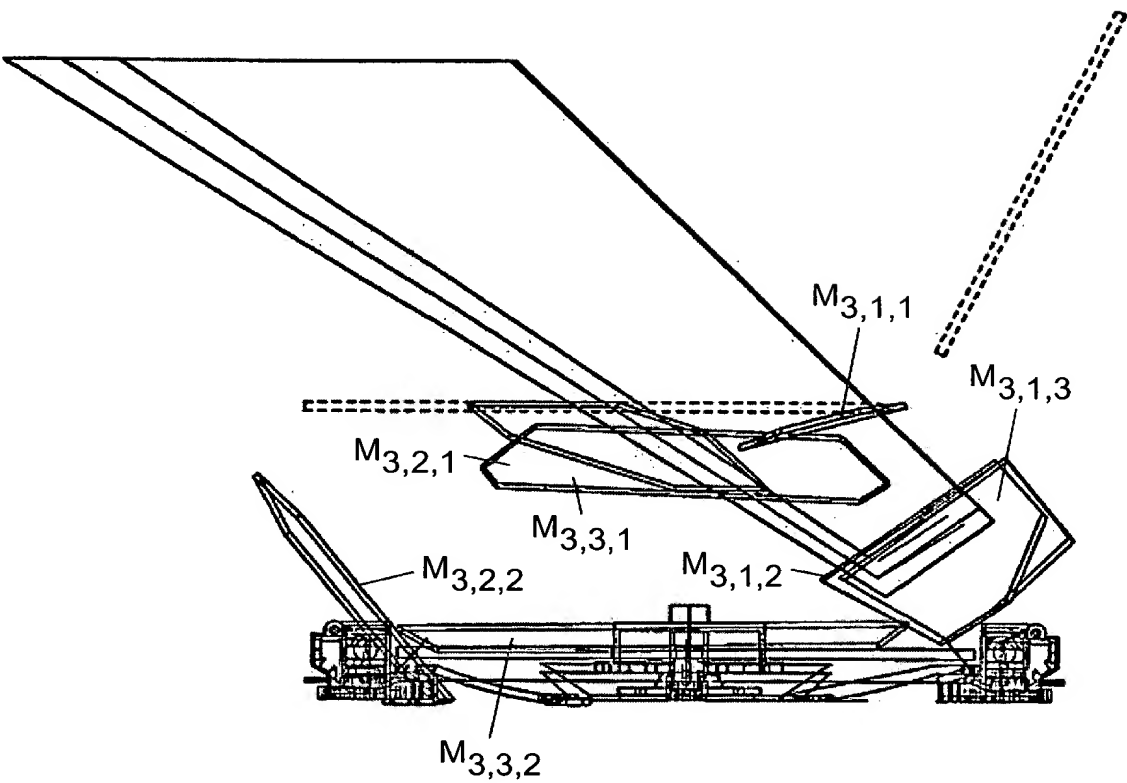
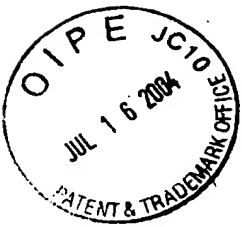


FIG. 5N4

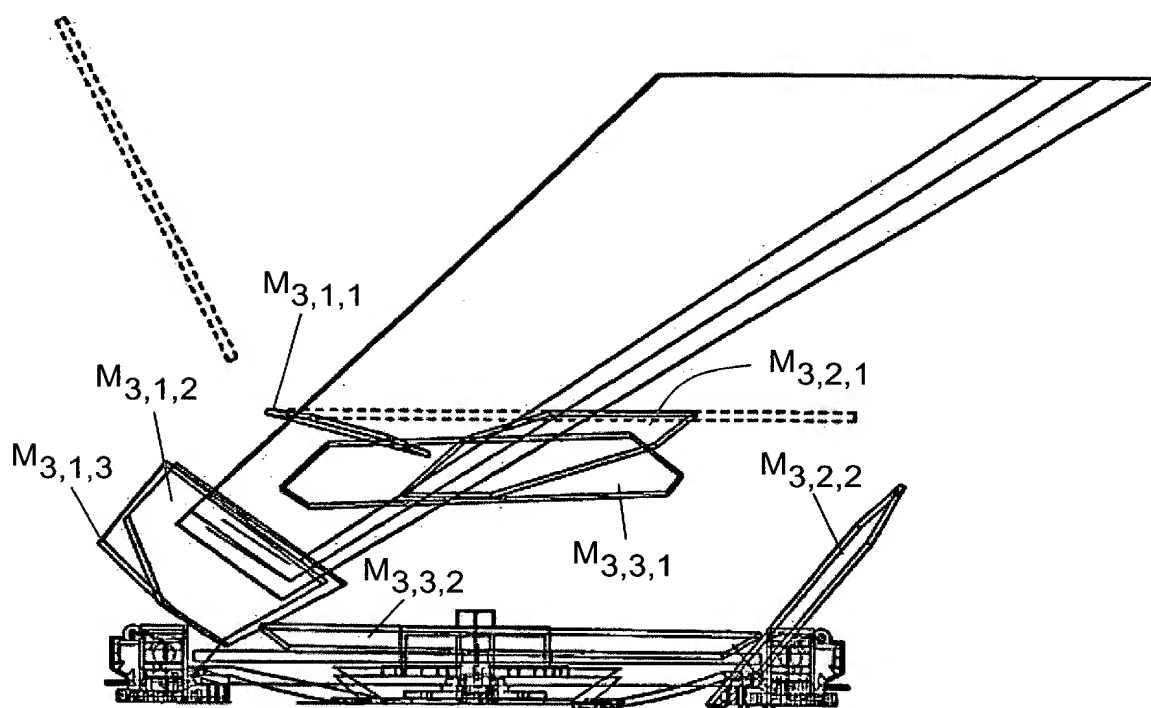
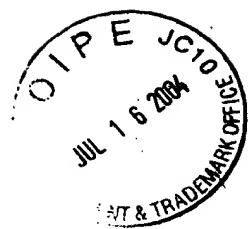


FIG. 5N5

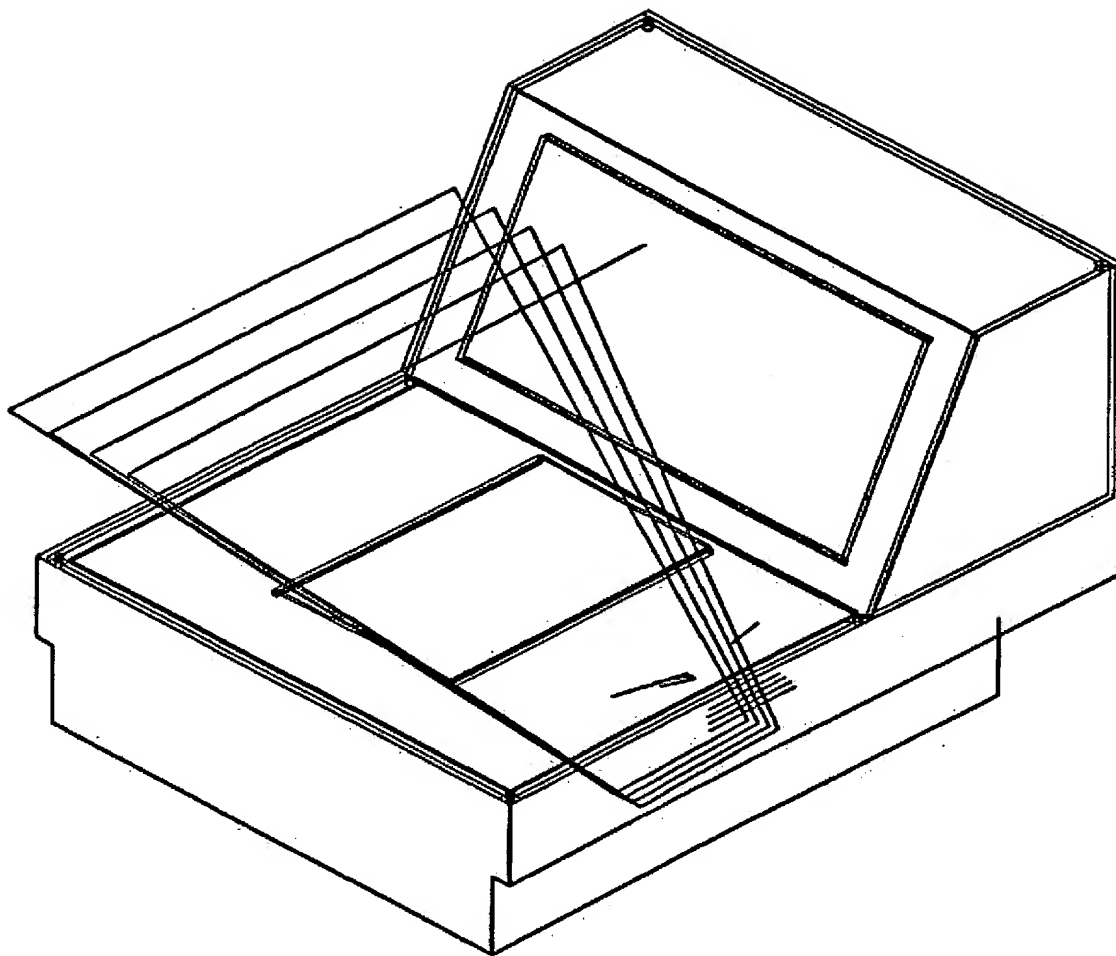
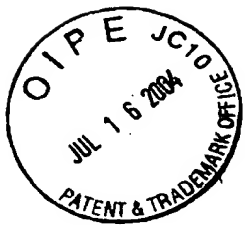


FIG. 501

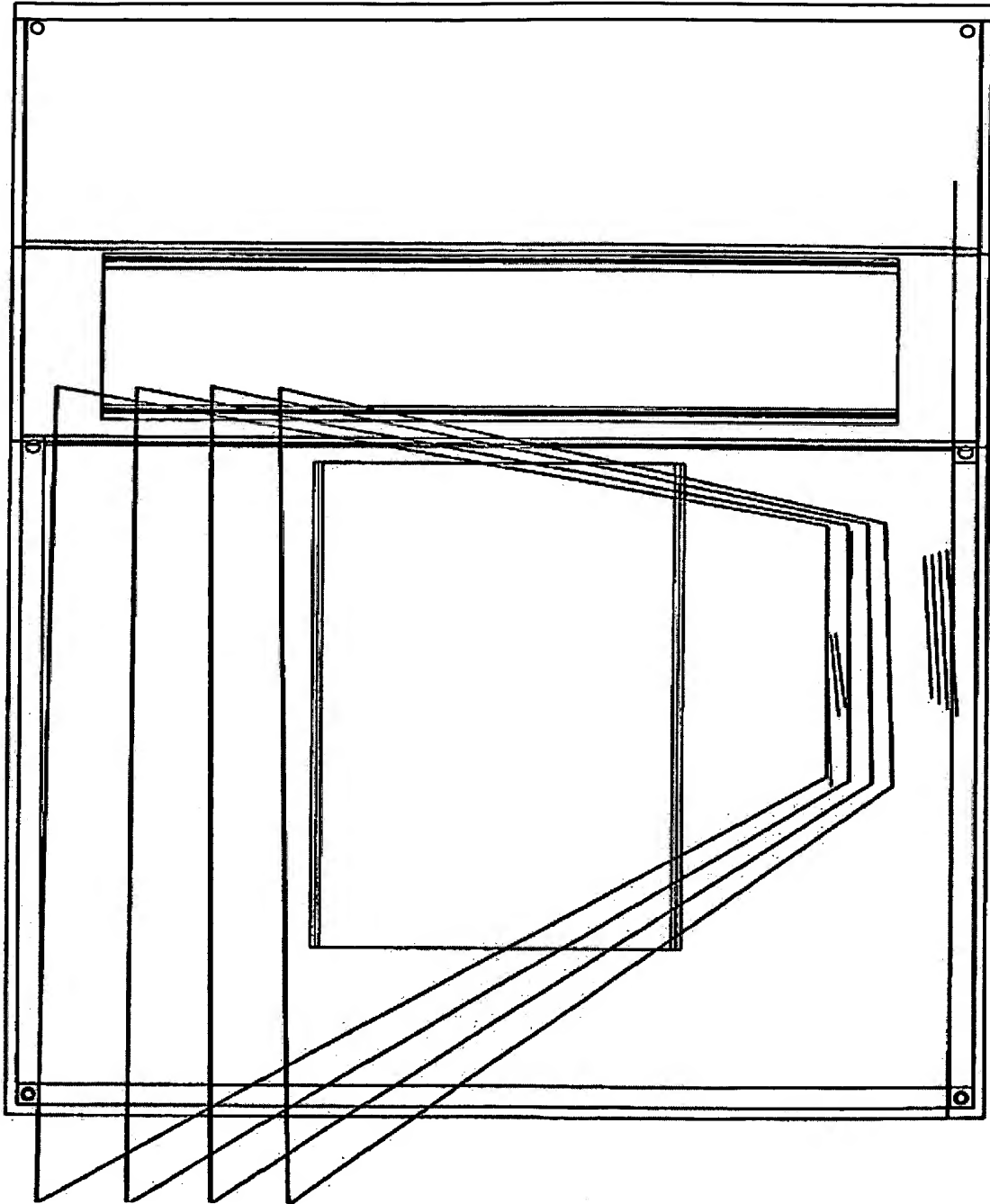


FIG. 502

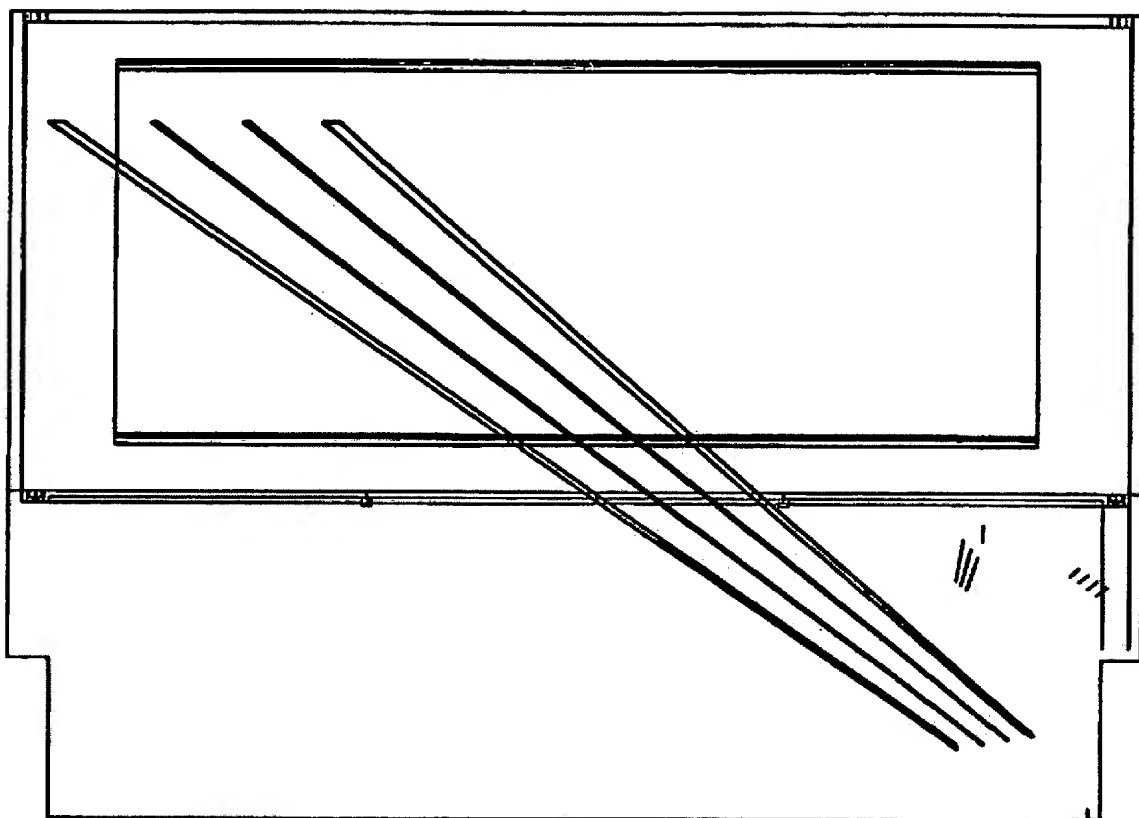
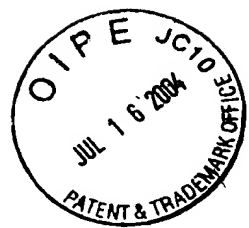


FIG. 503

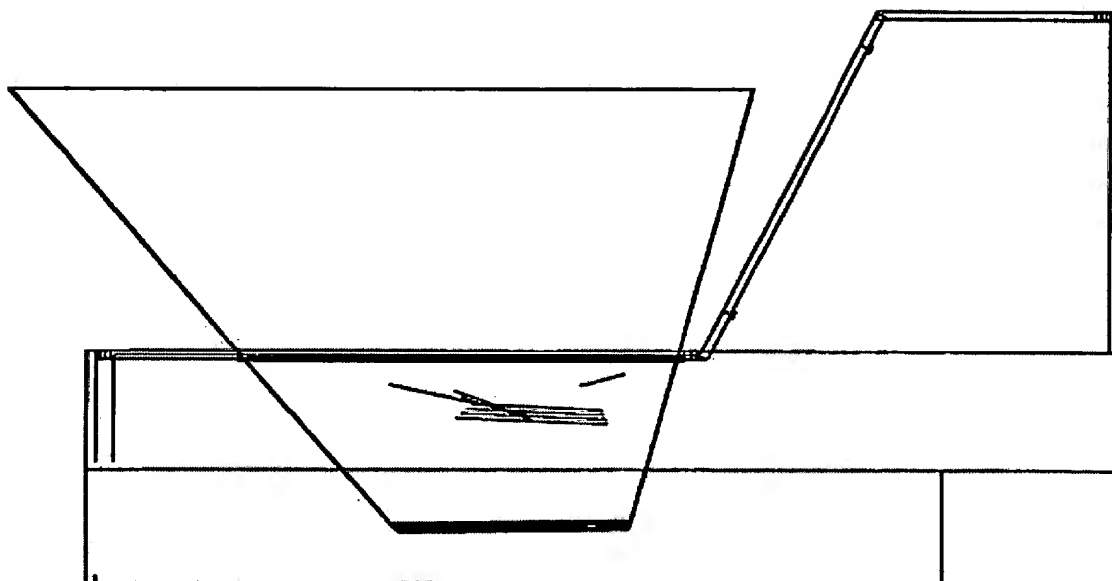
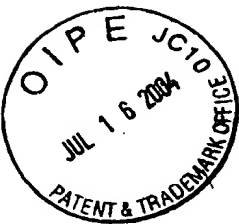


FIG. 504

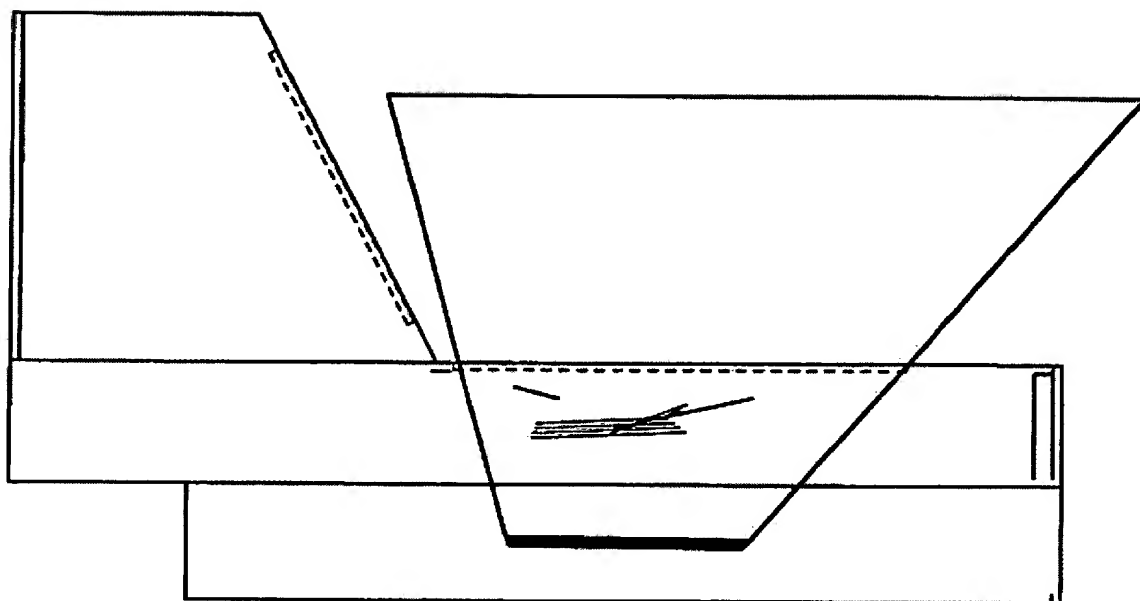
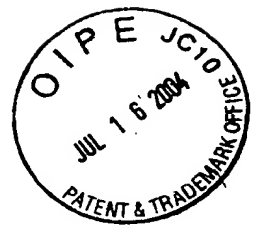


FIG. 505

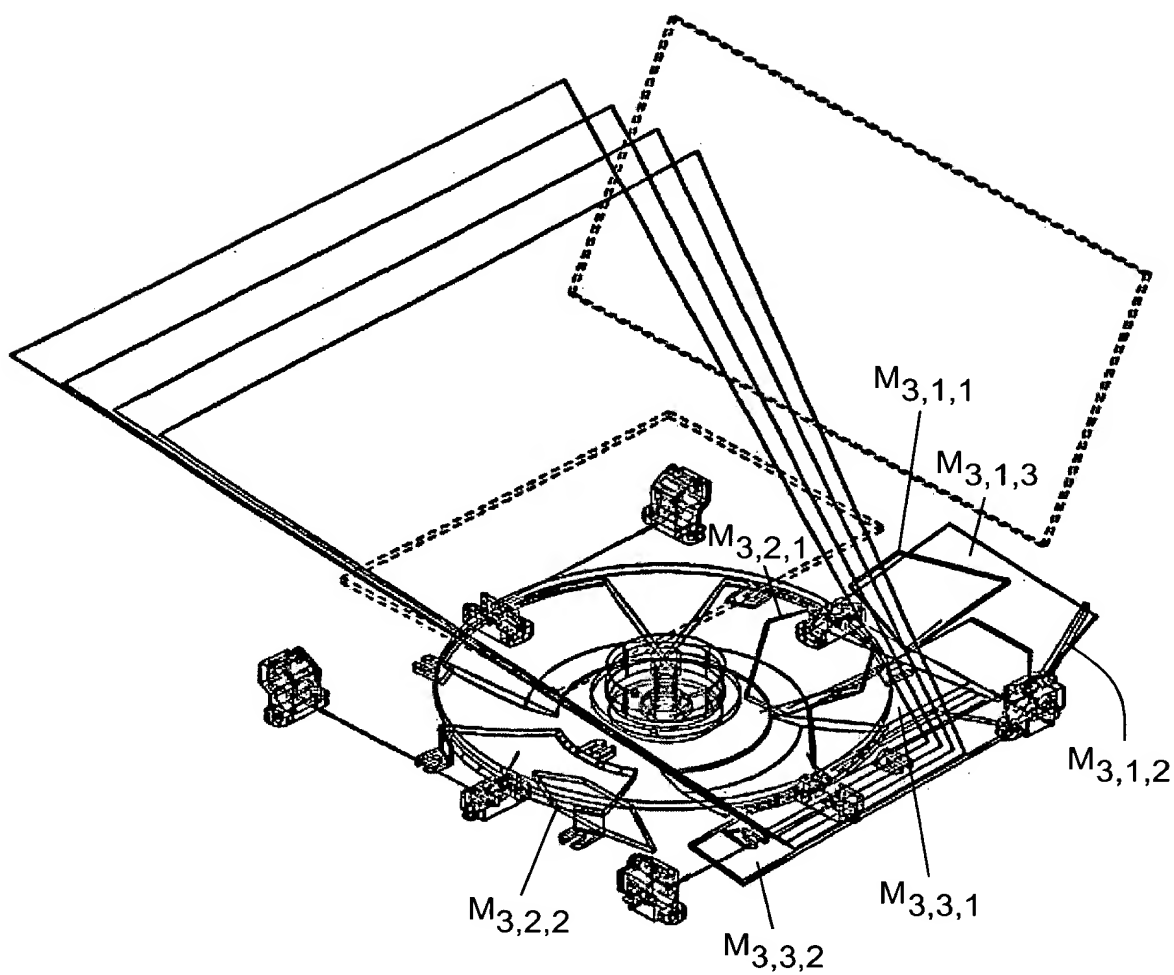


FIG. 5P1

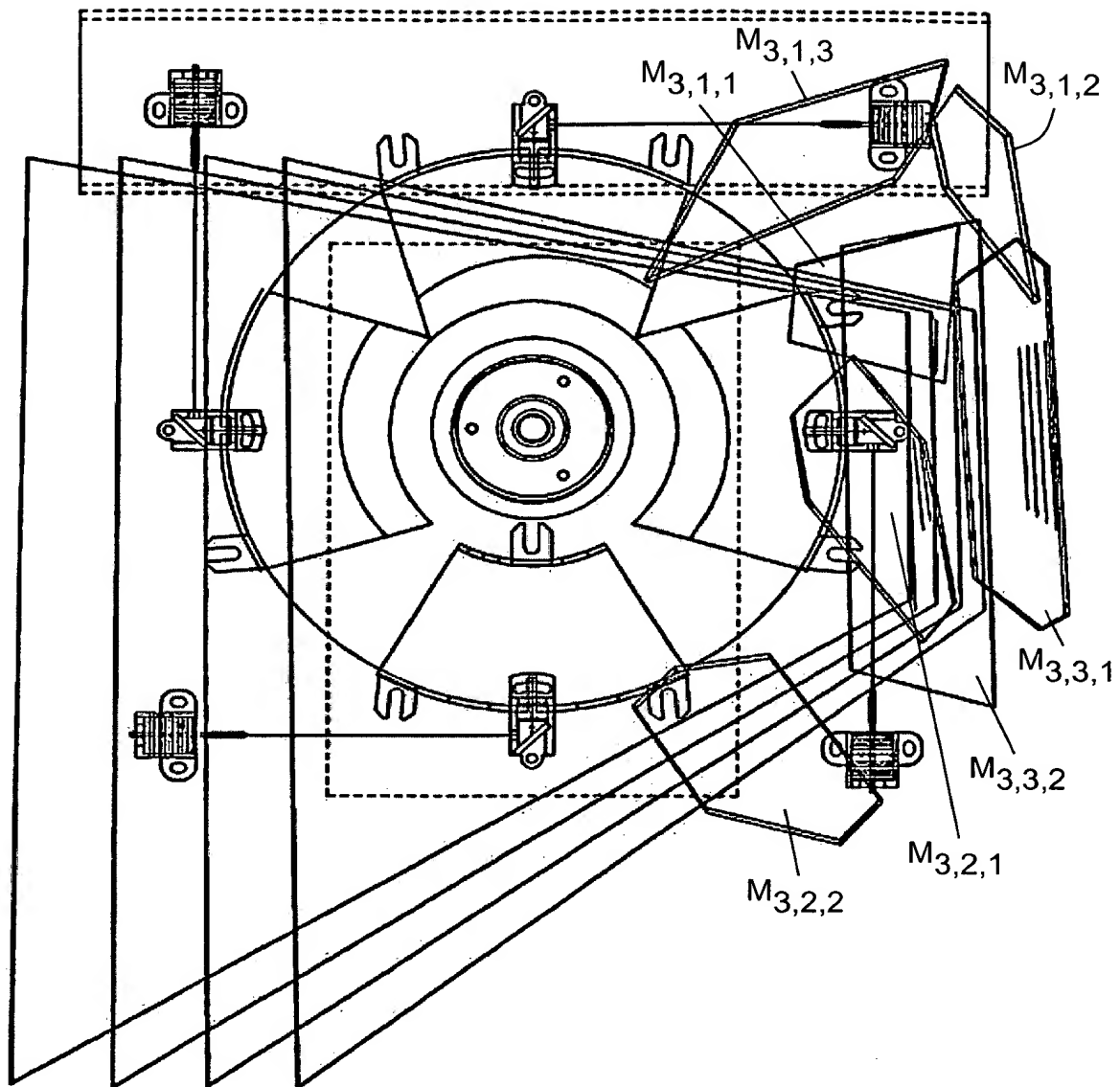


FIG. 5P2

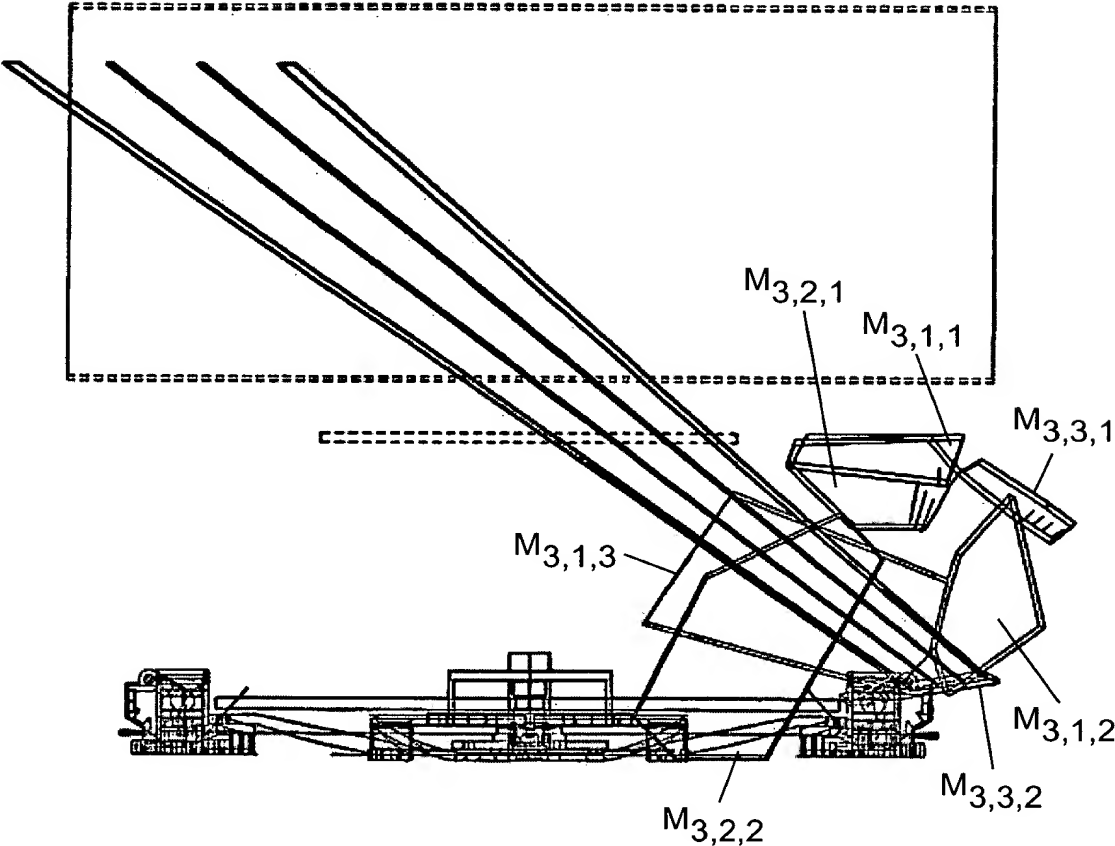


FIG. 5P3

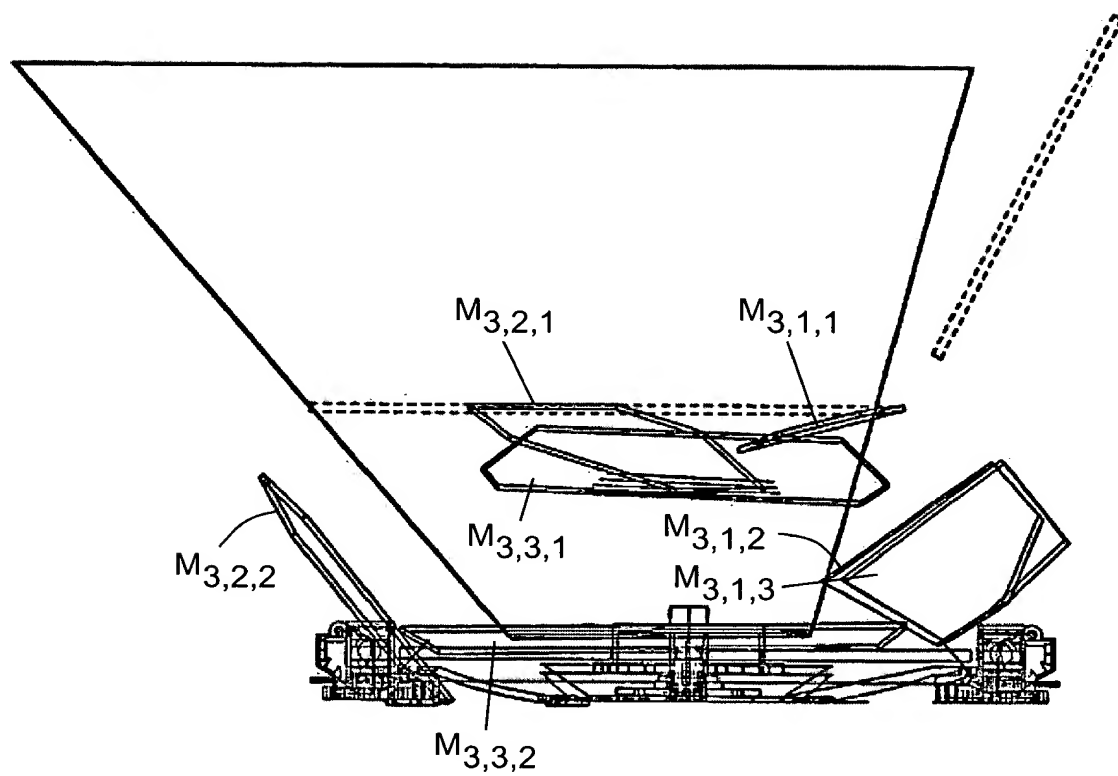
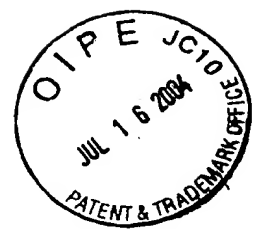


FIG. 5P4

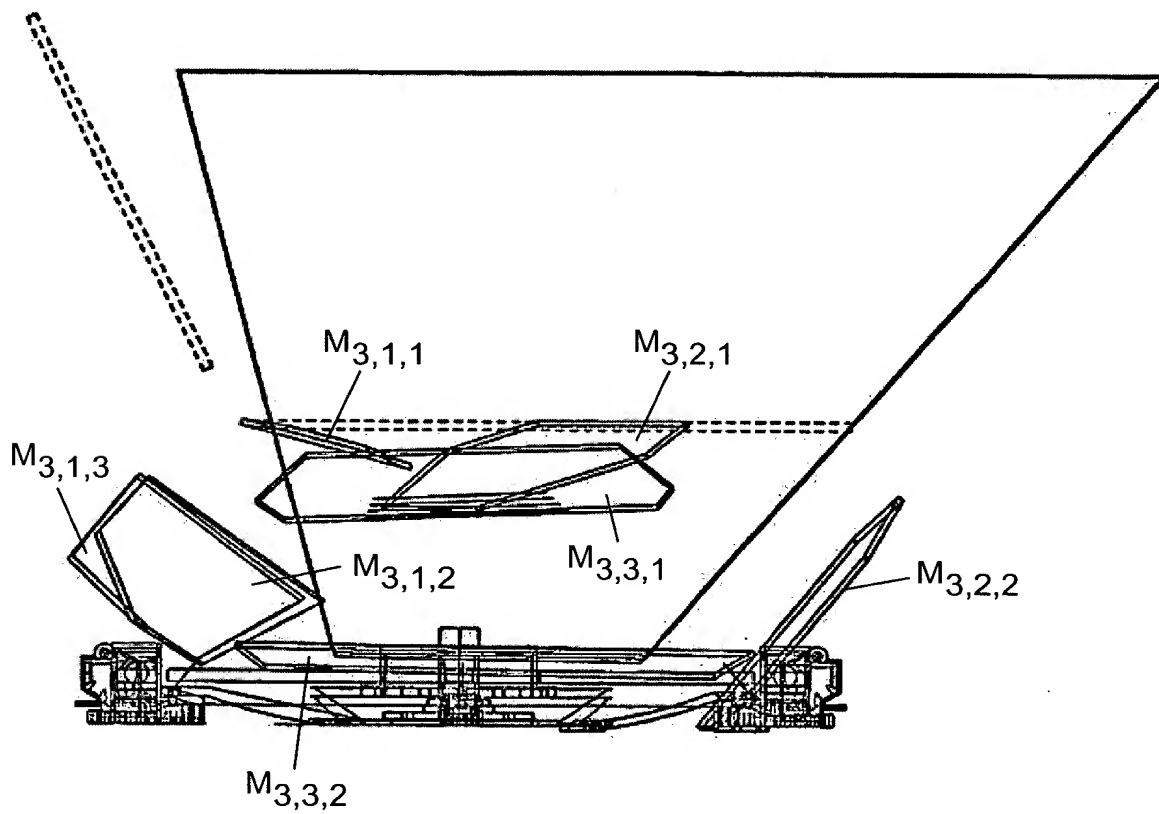


FIG. 5P5

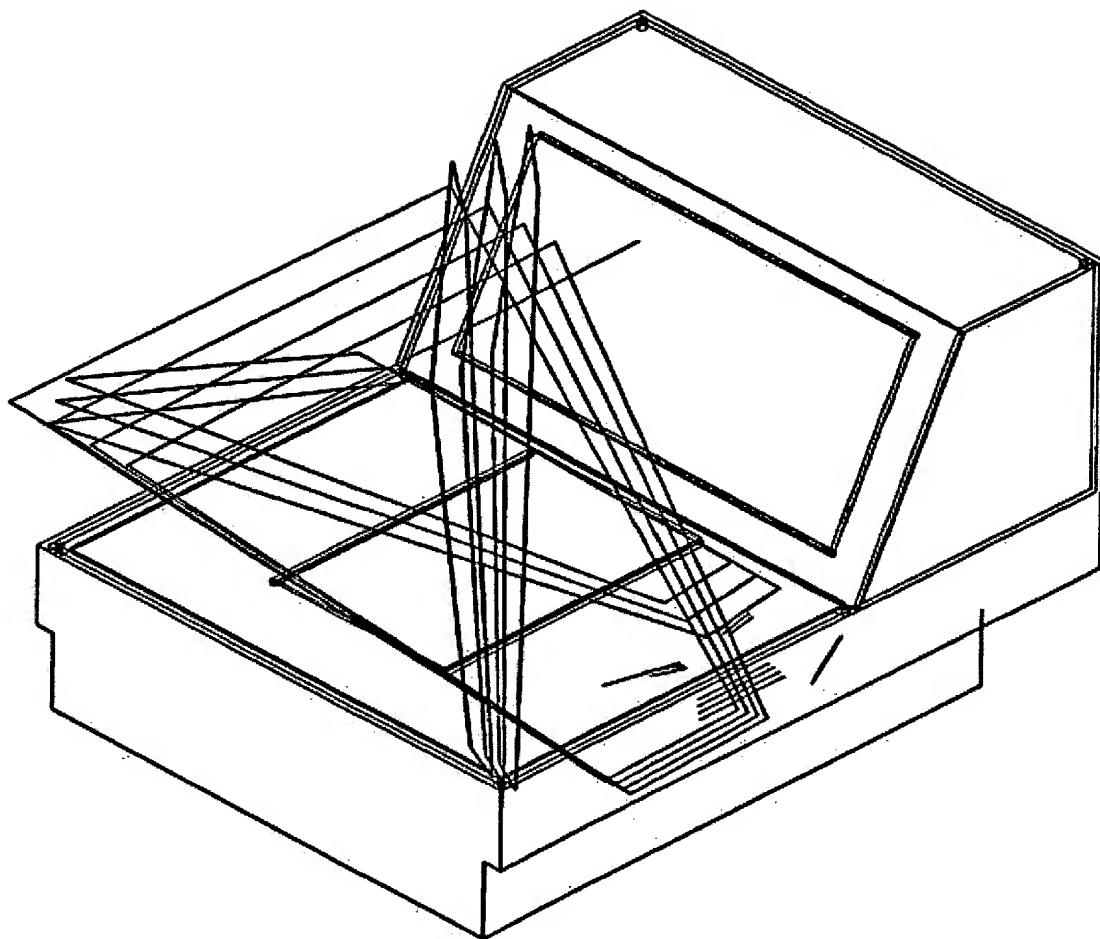
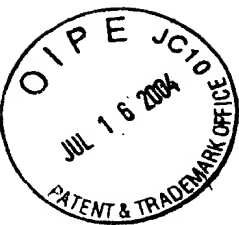


FIG. 5Q1

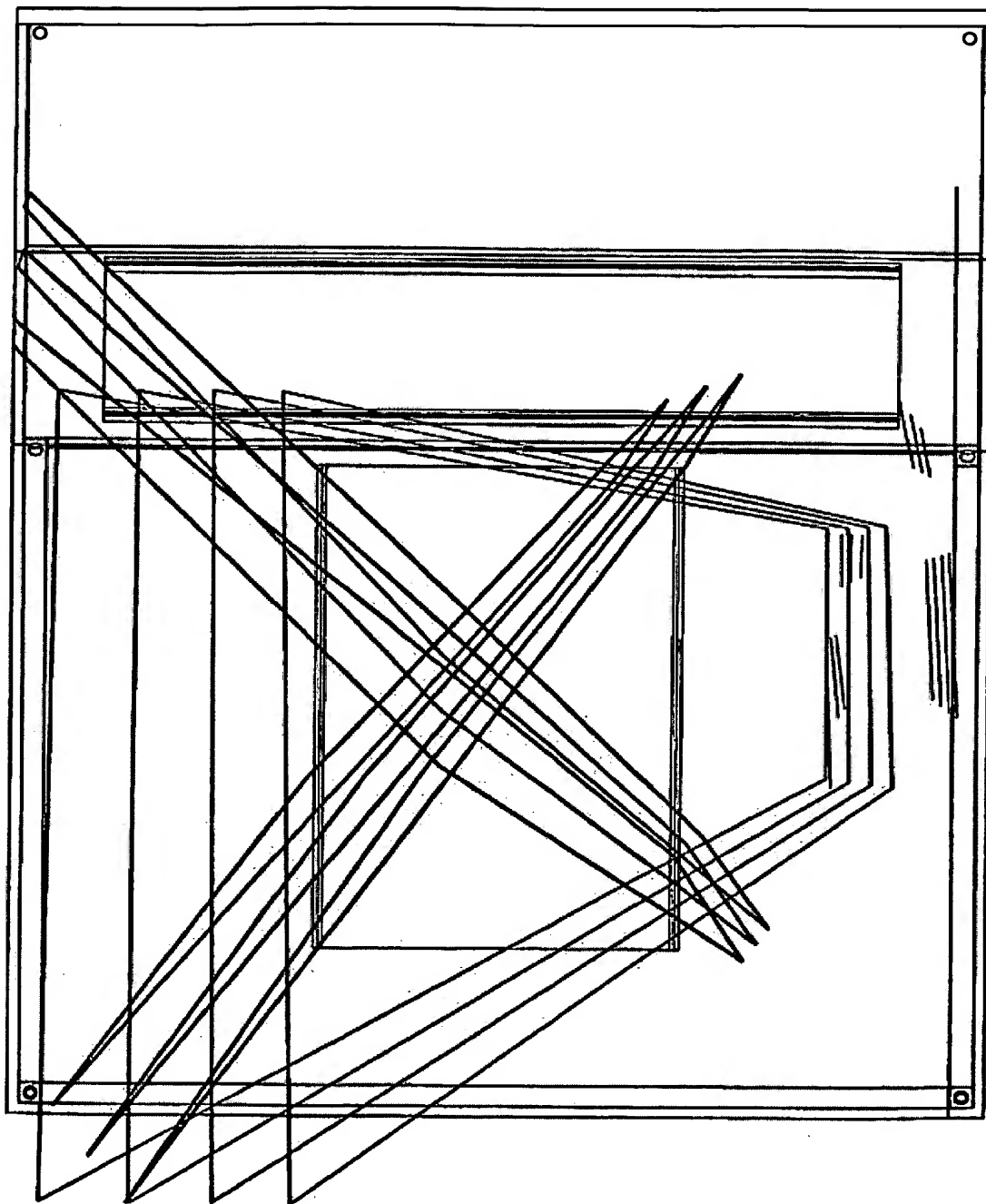
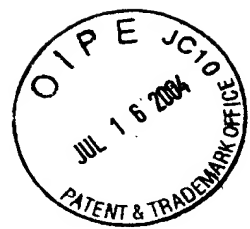


FIG. 5Q2

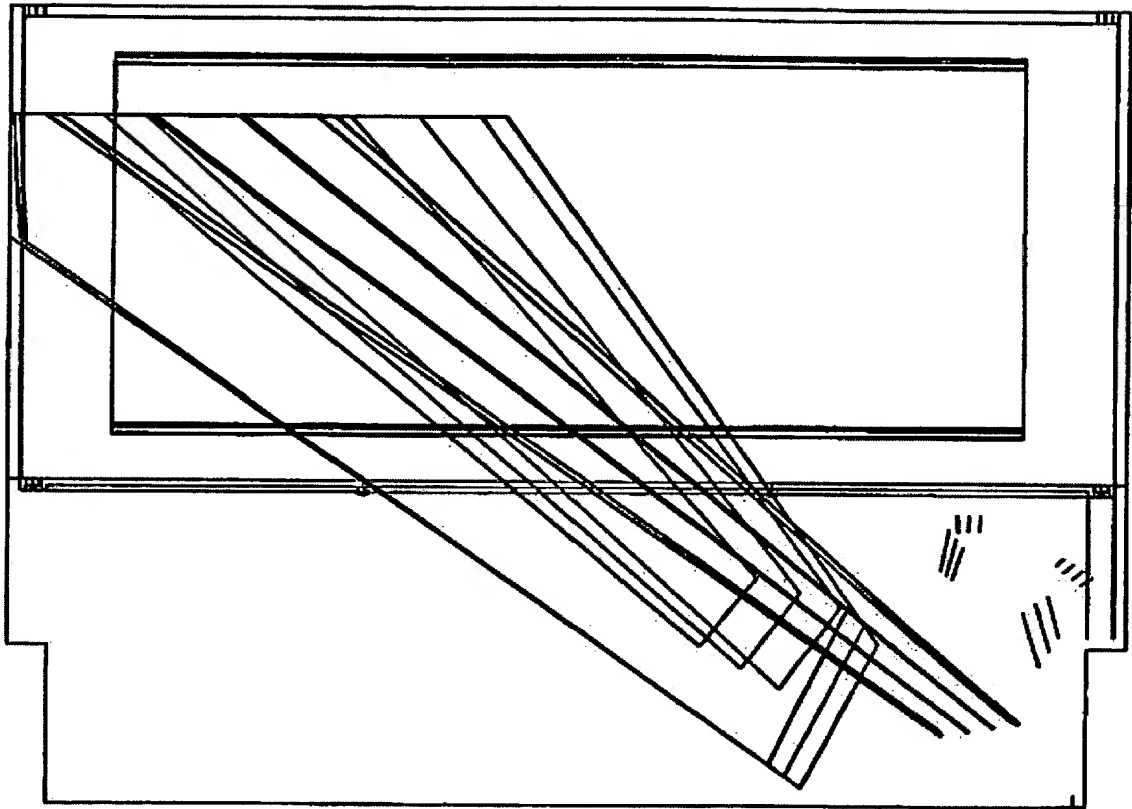
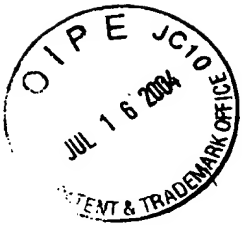


FIG. 5Q3

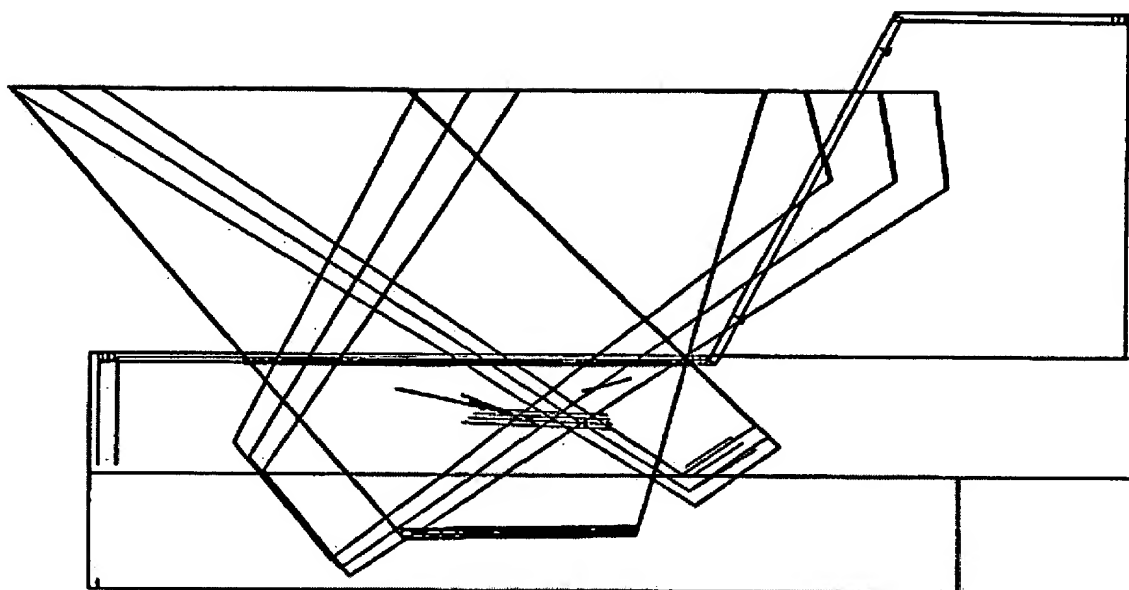


FIG. 5Q4

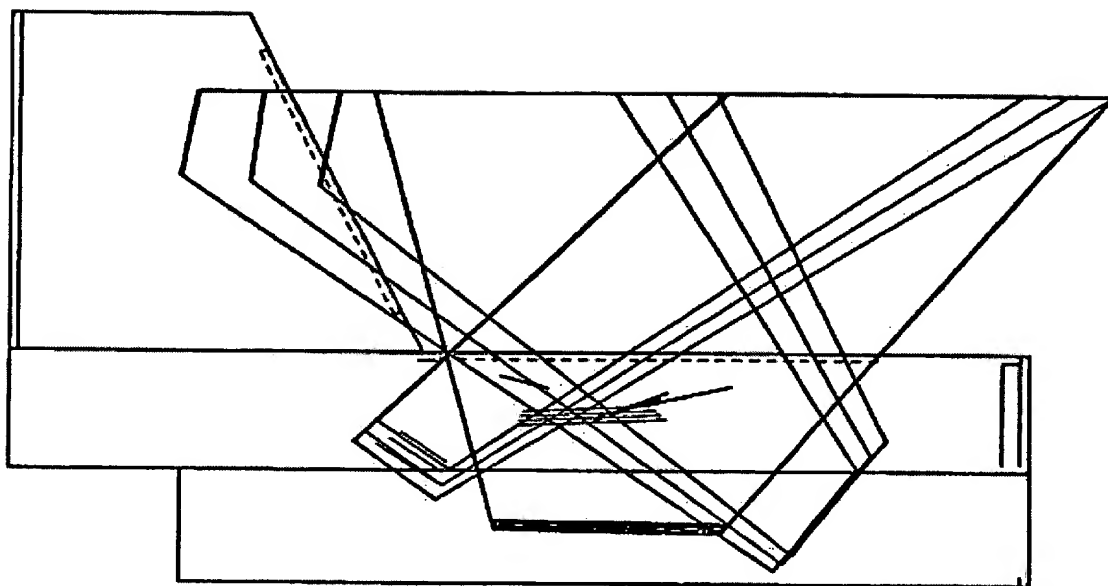
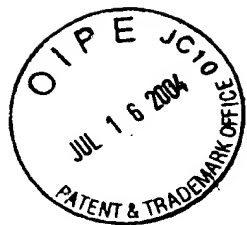


FIG. 5Q5

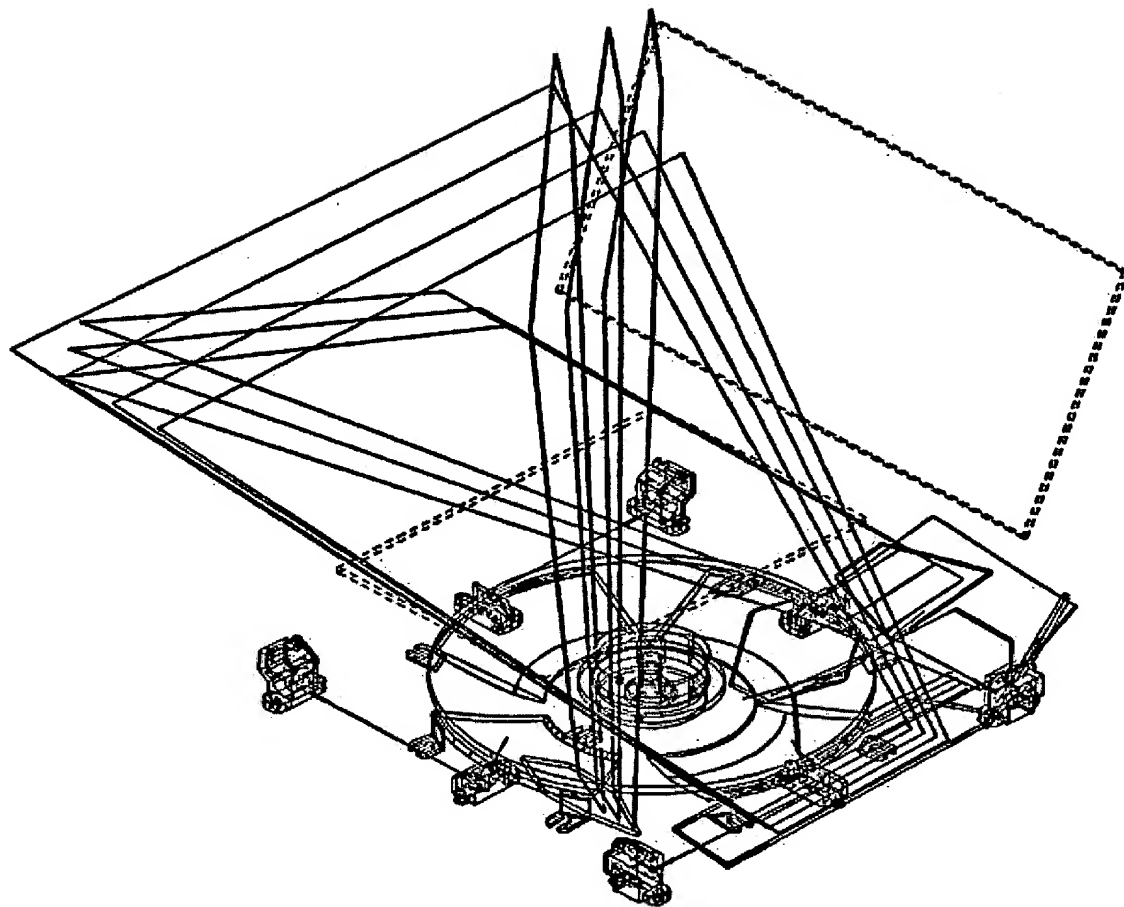
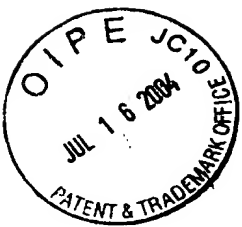


FIG. 5R1

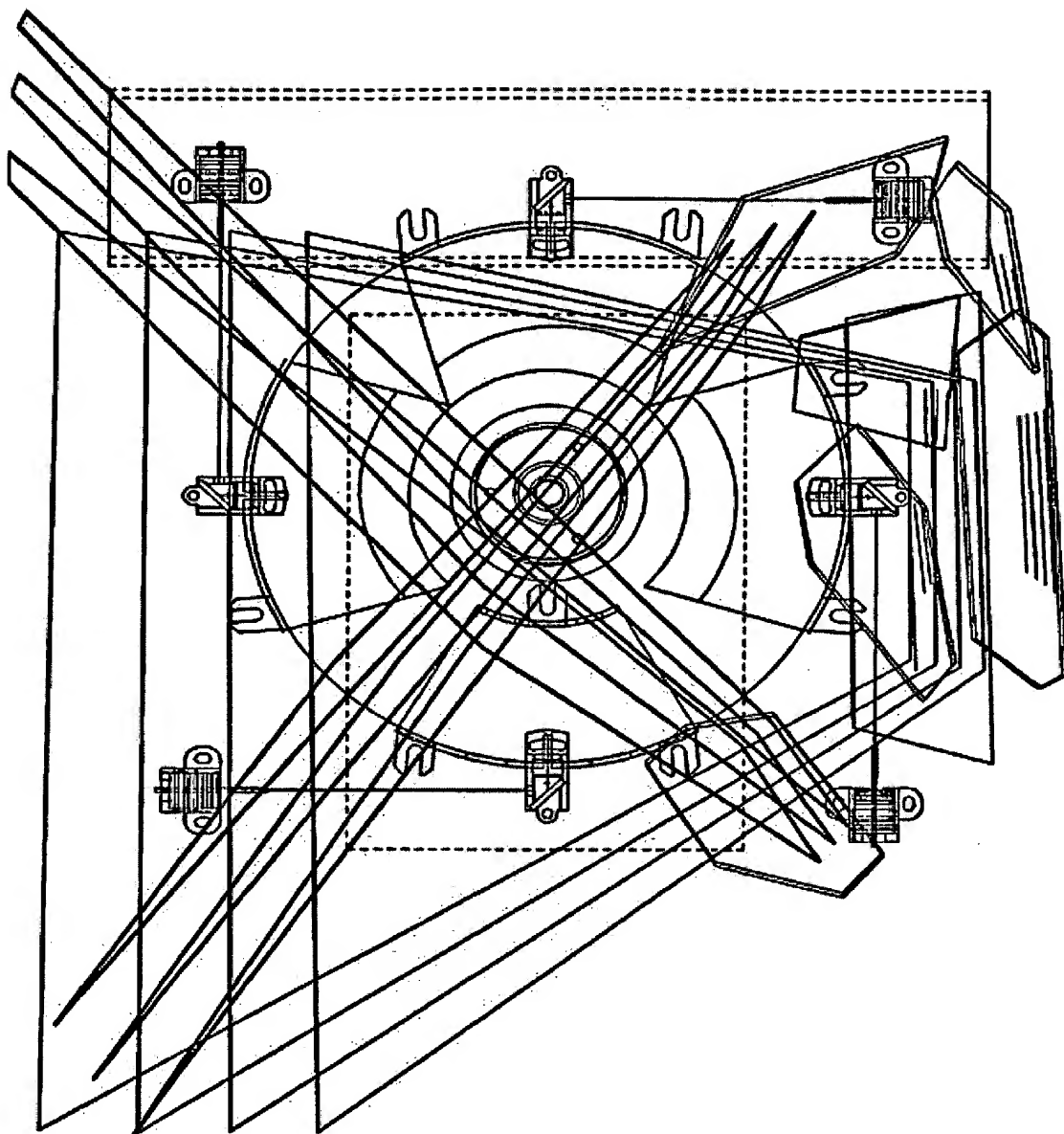


FIG. 5R2

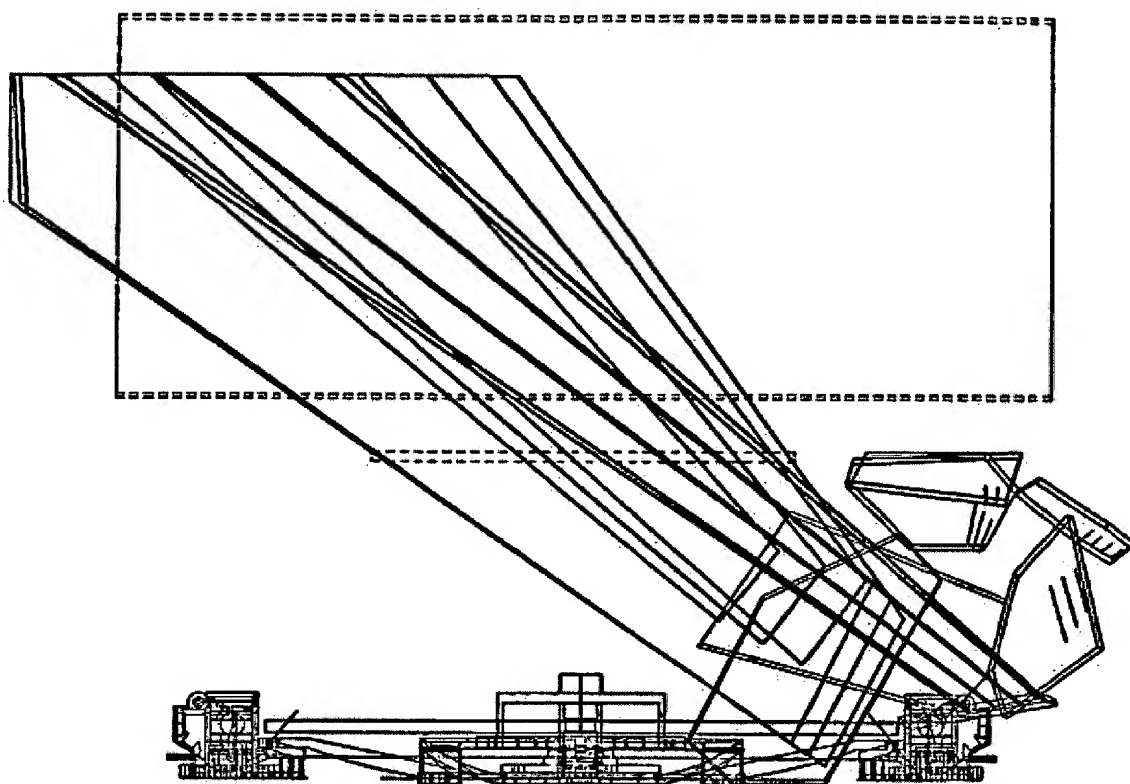


FIG. 5R3

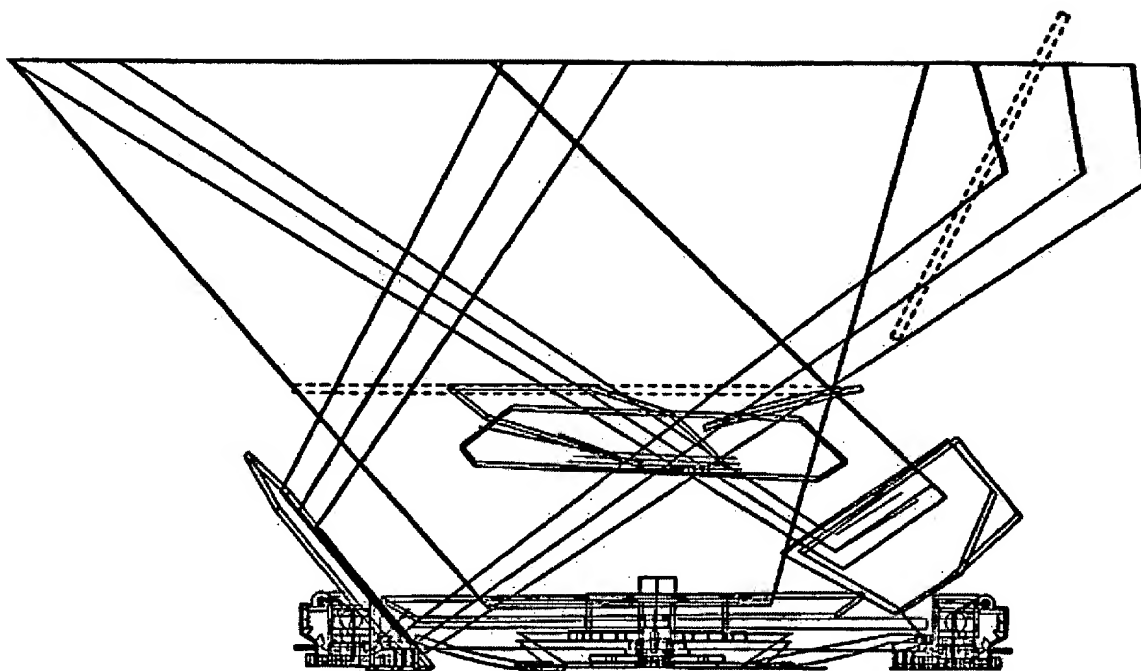
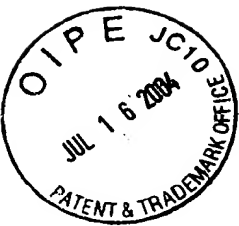


FIG. 5R4

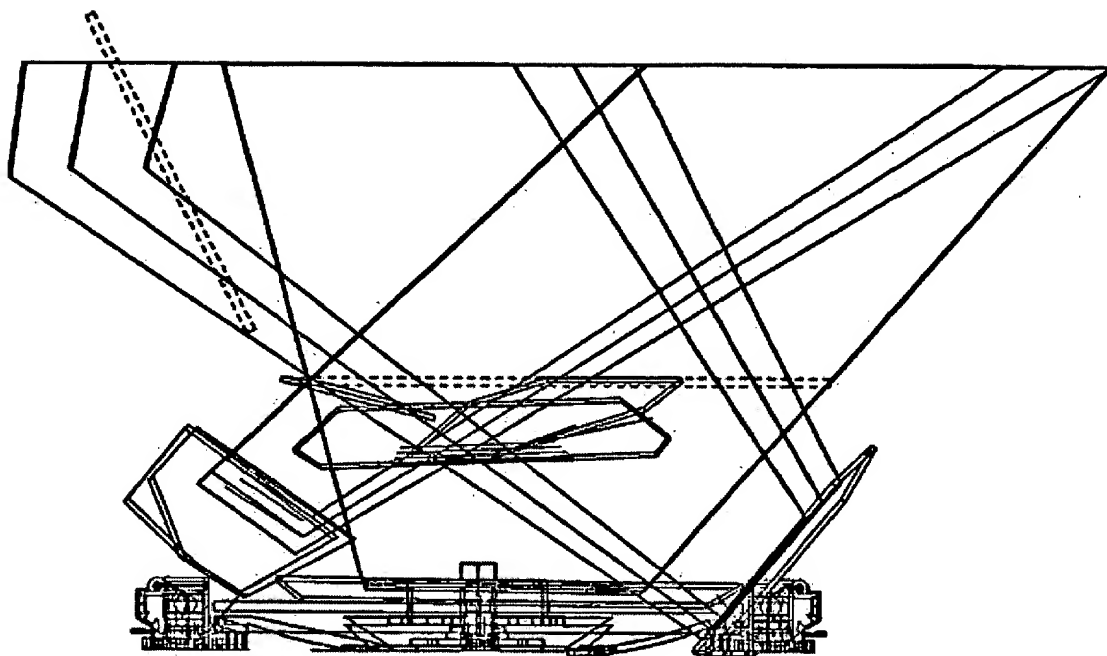
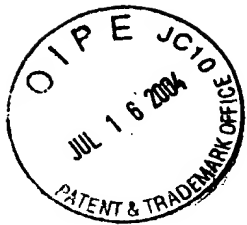


FIG. 5R5

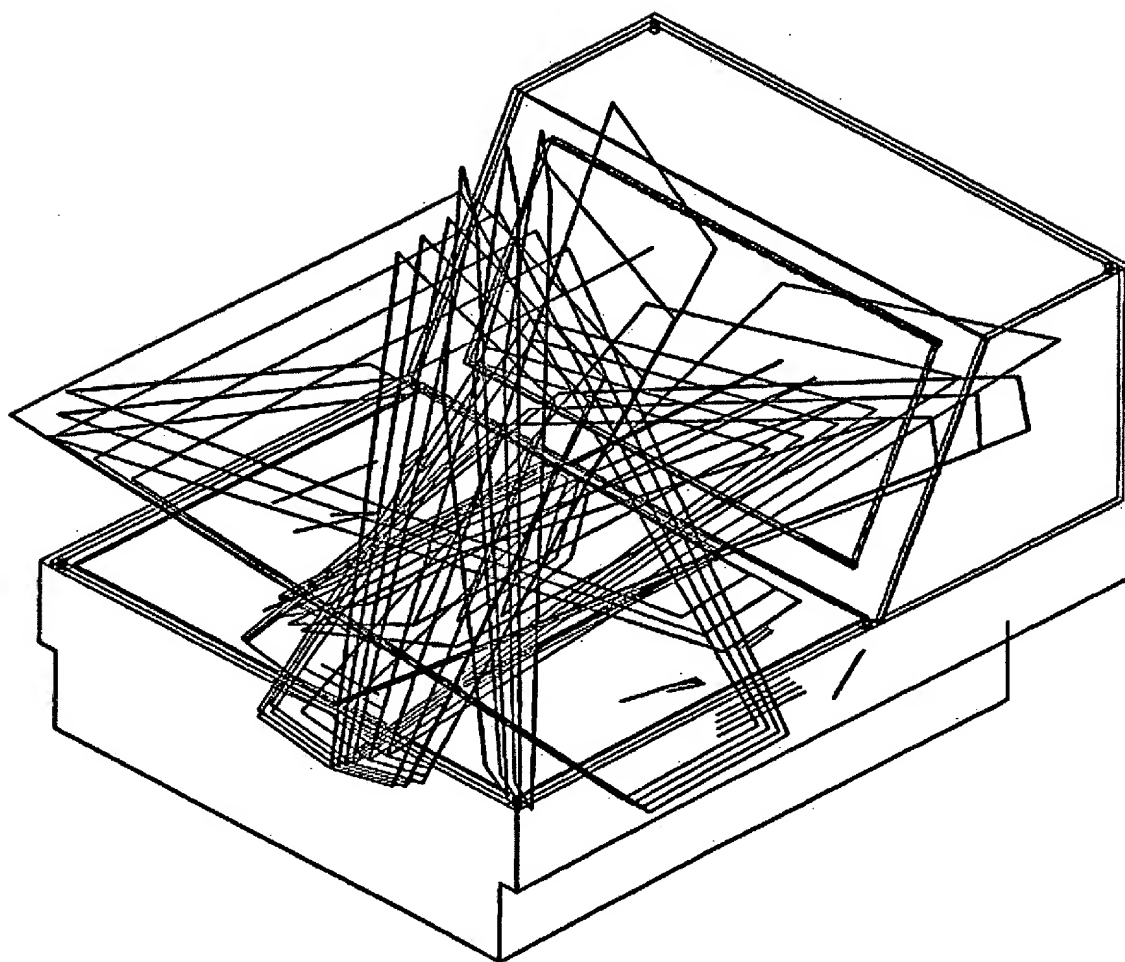


FIG. 5S1

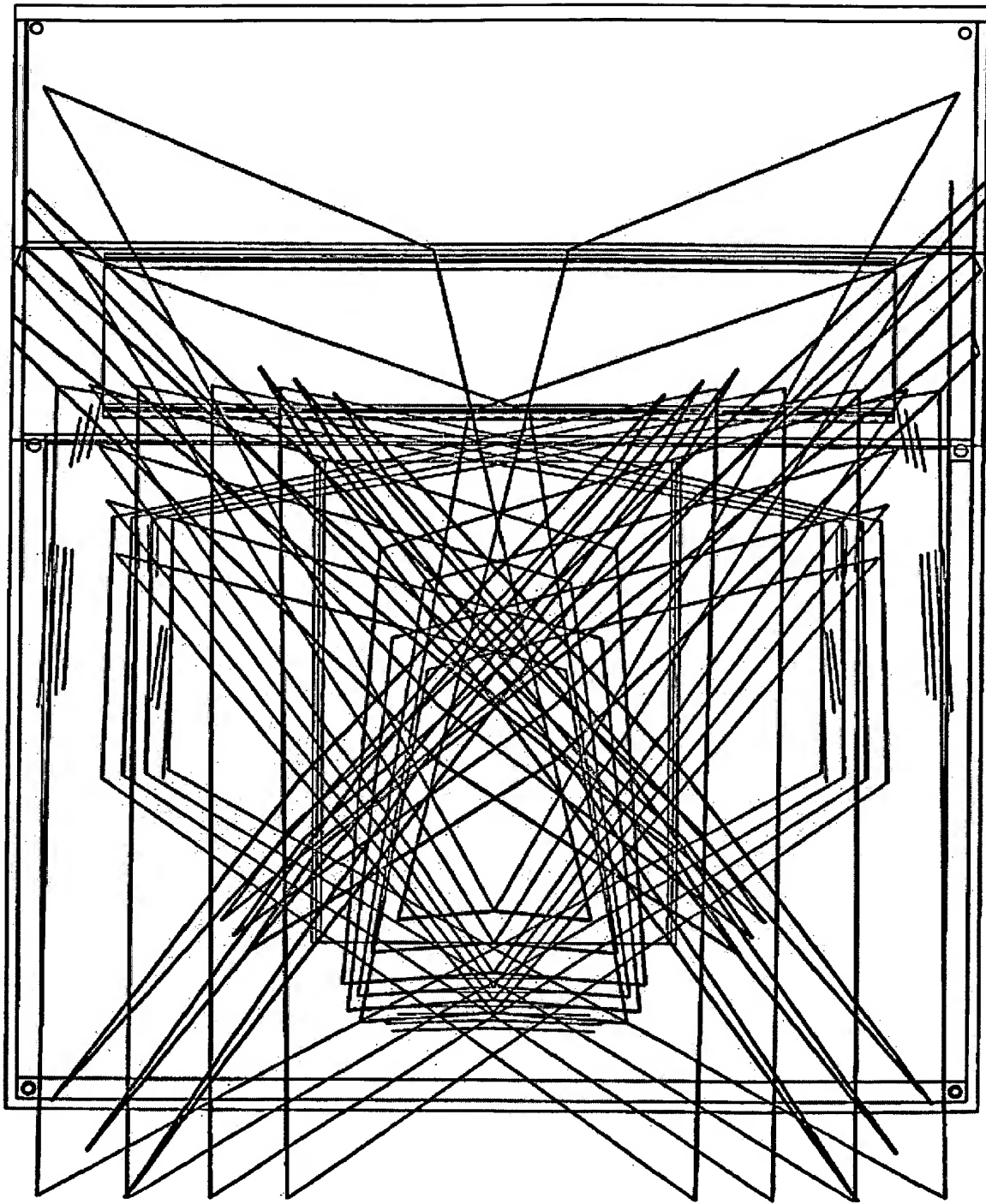


FIG. 5S2

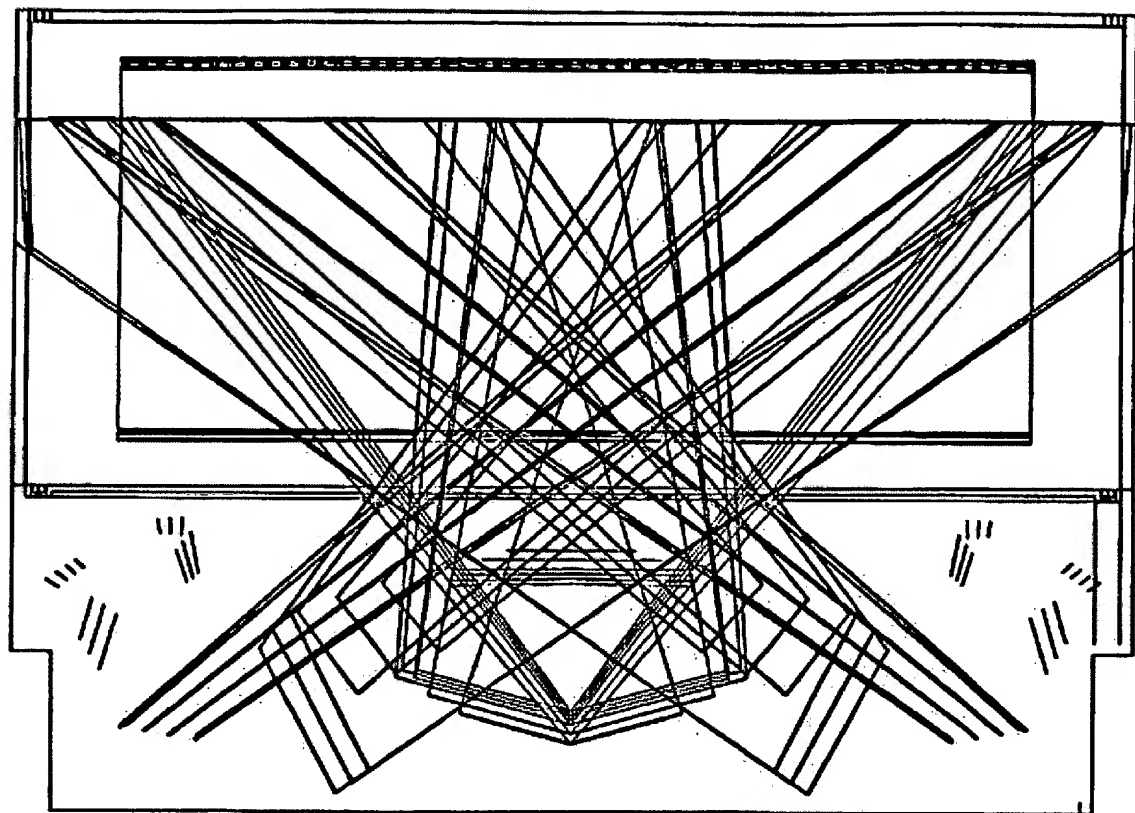


FIG. 5S3

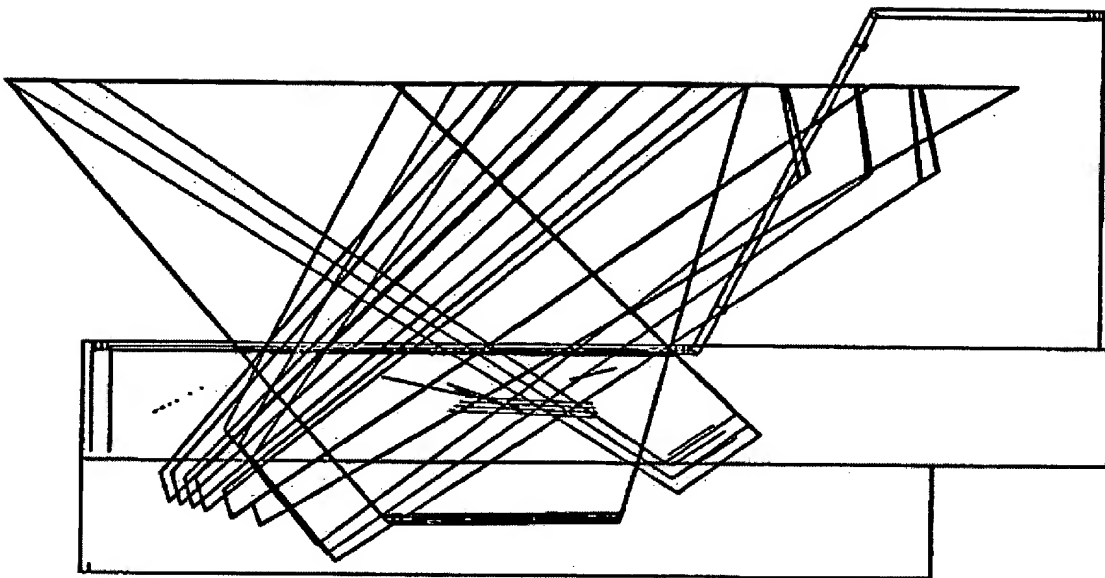


FIG. 5S4

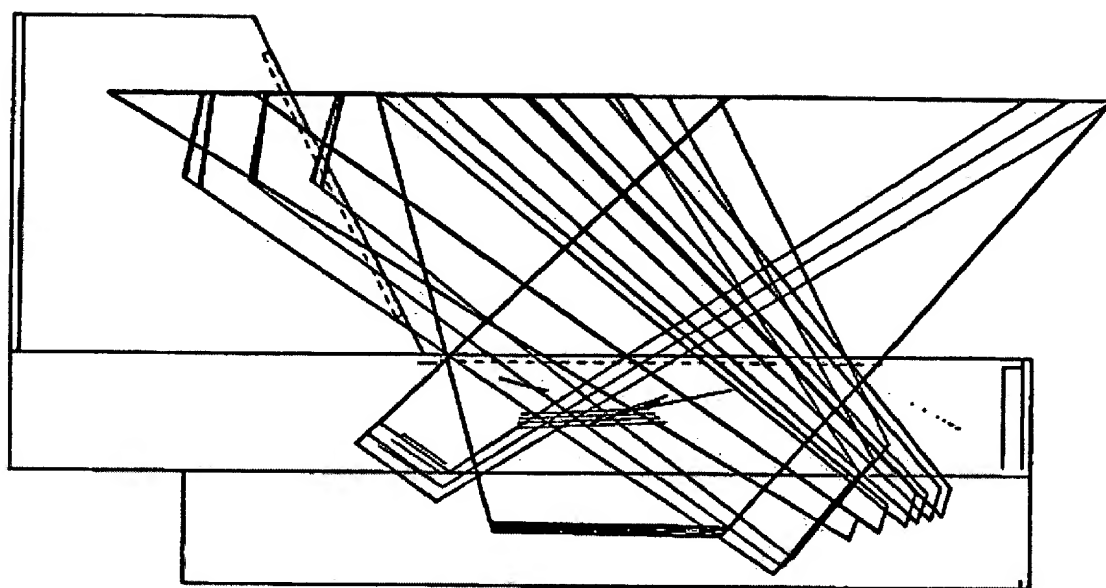


FIG. 5S5

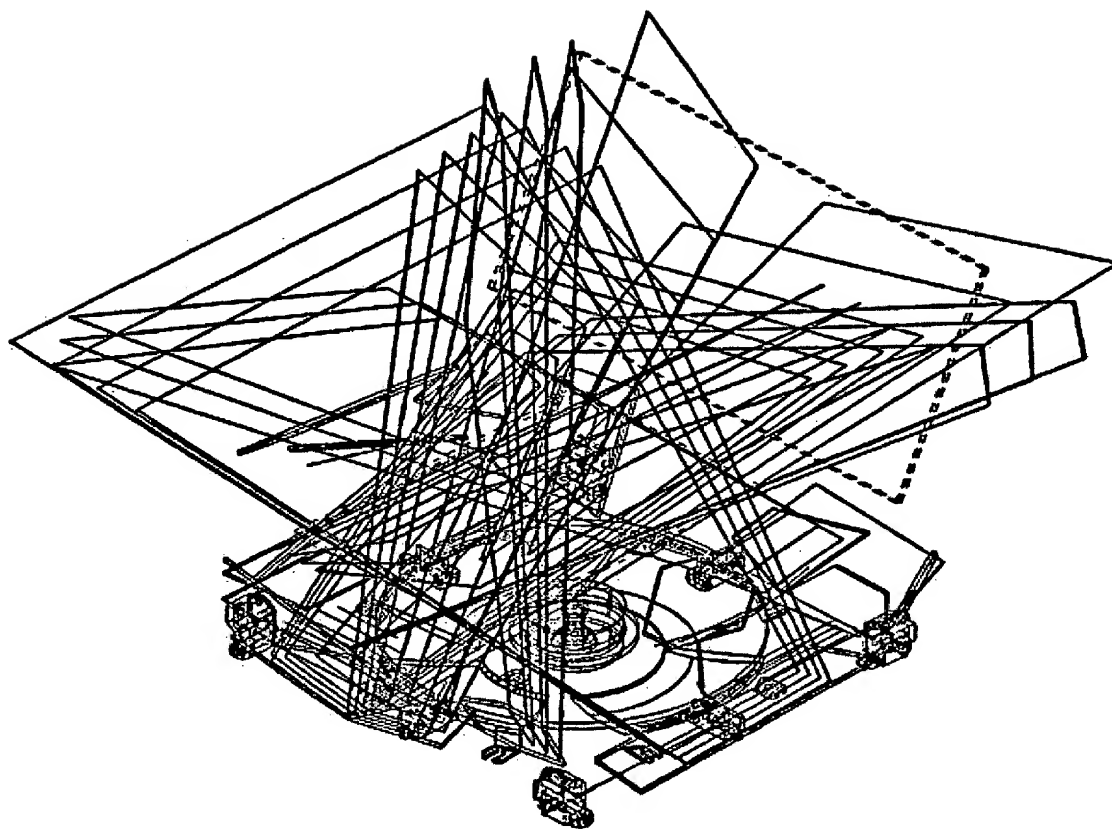


FIG. 5T1

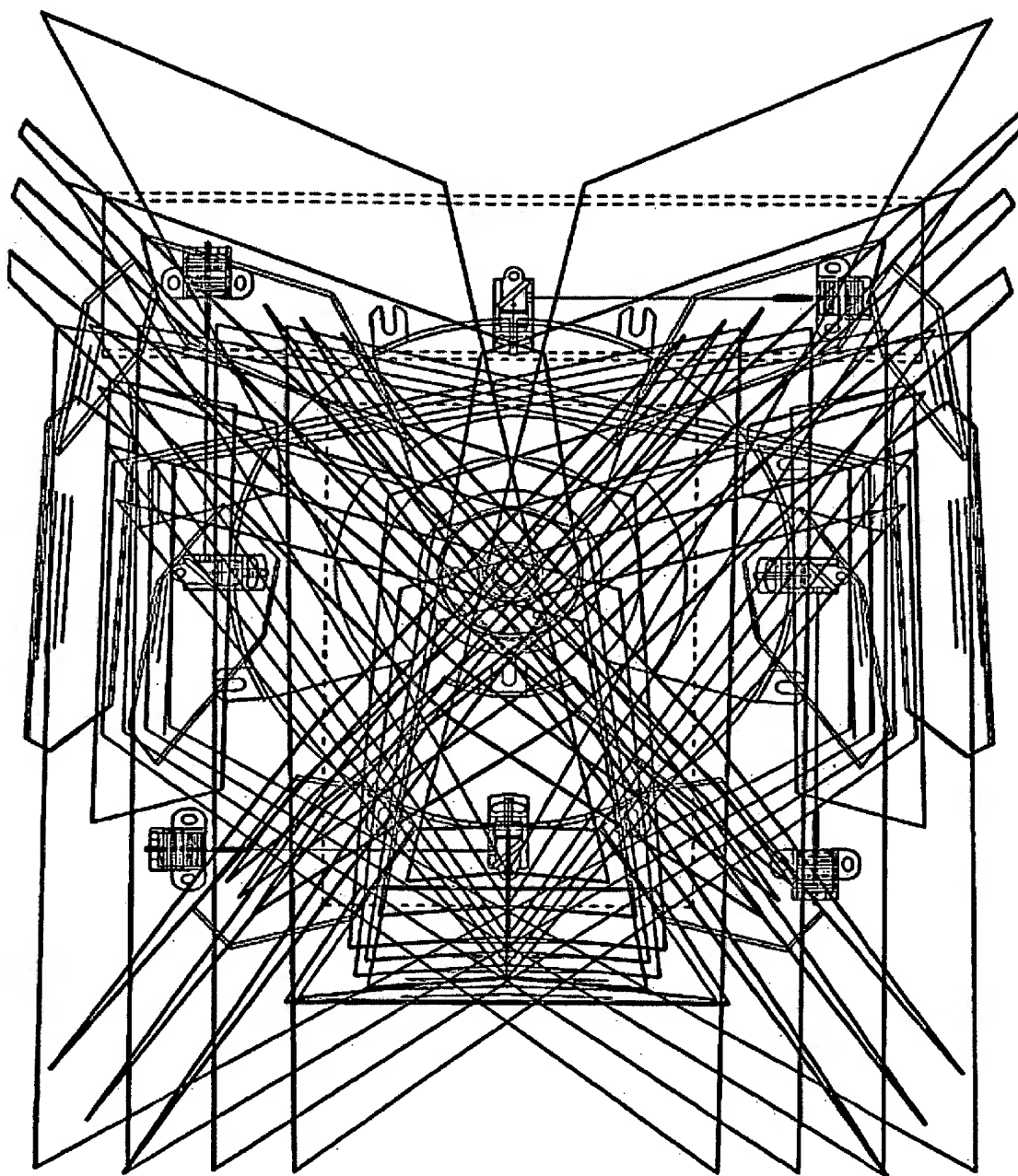


FIG. 5T2

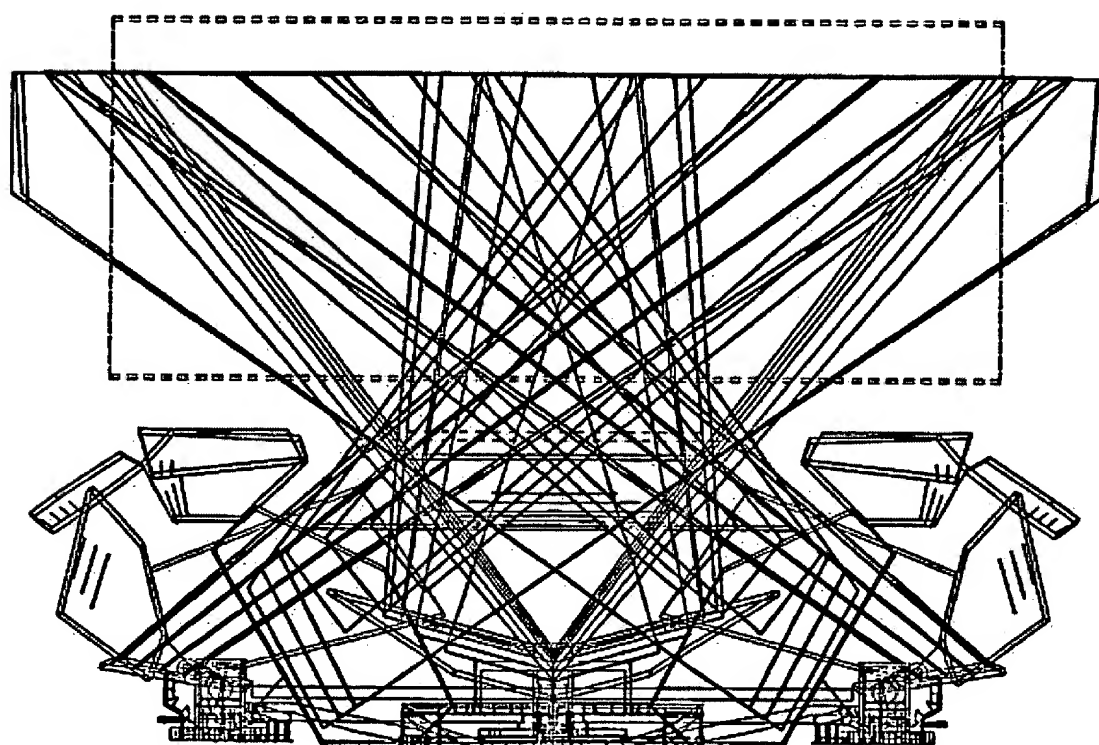


FIG. 5T3

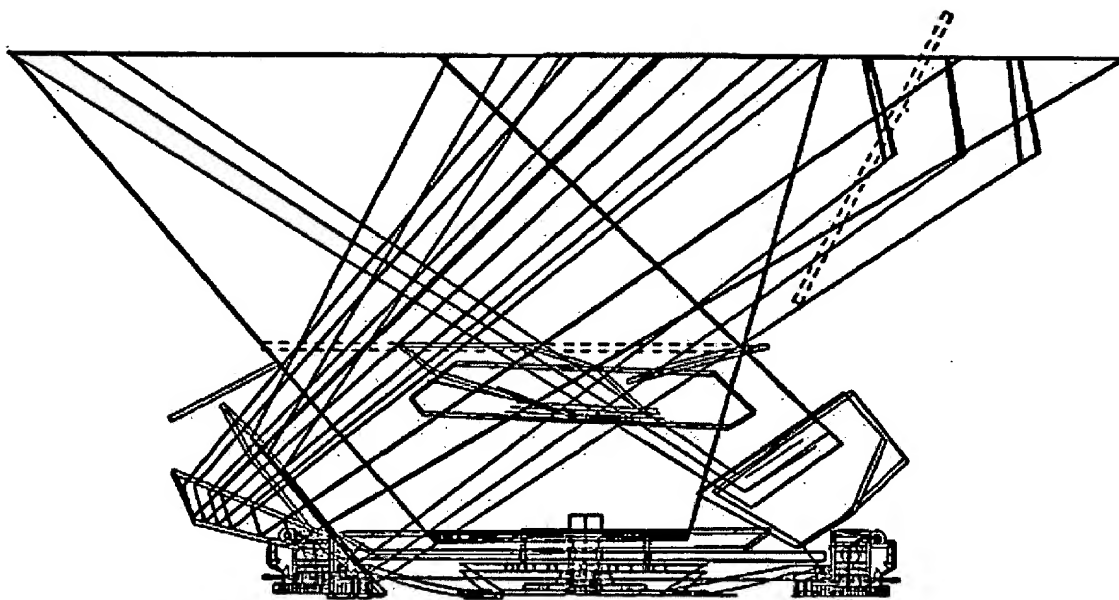


FIG. 5T4

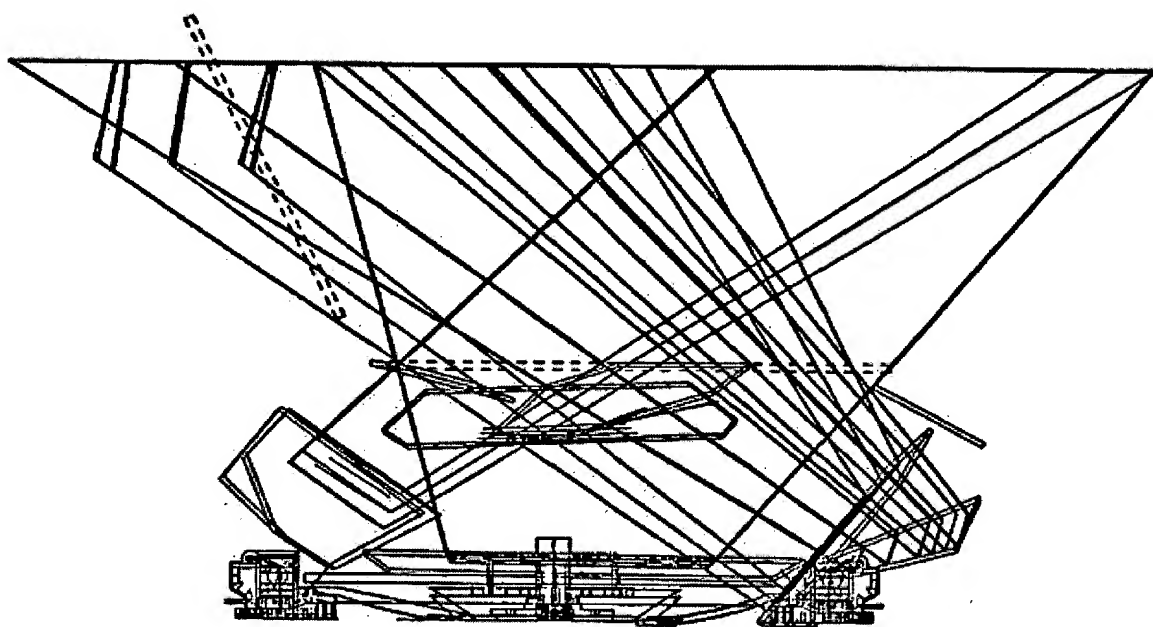
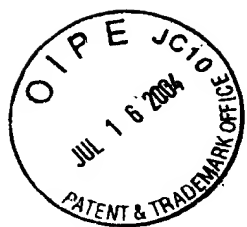


FIG. 5T5

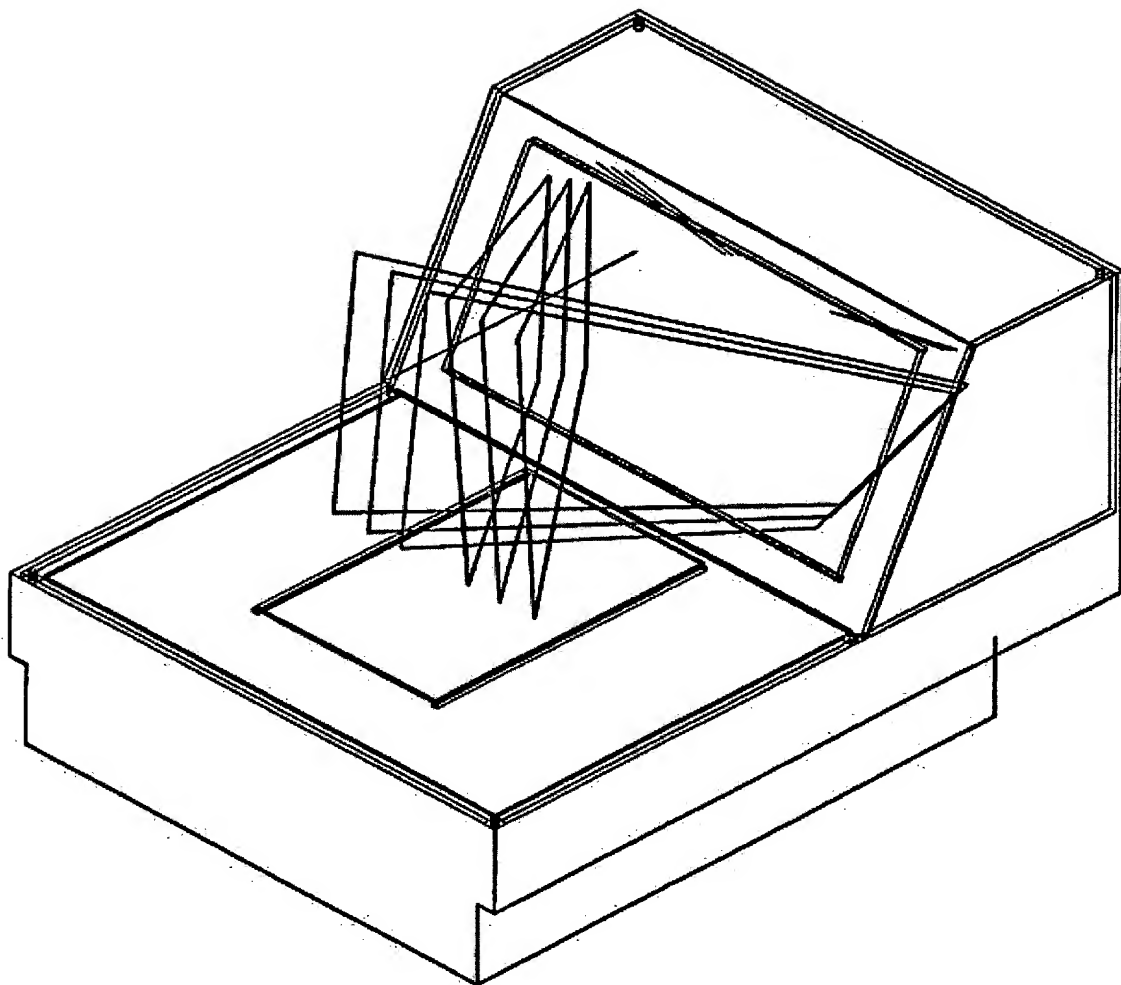


FIG. 5U1

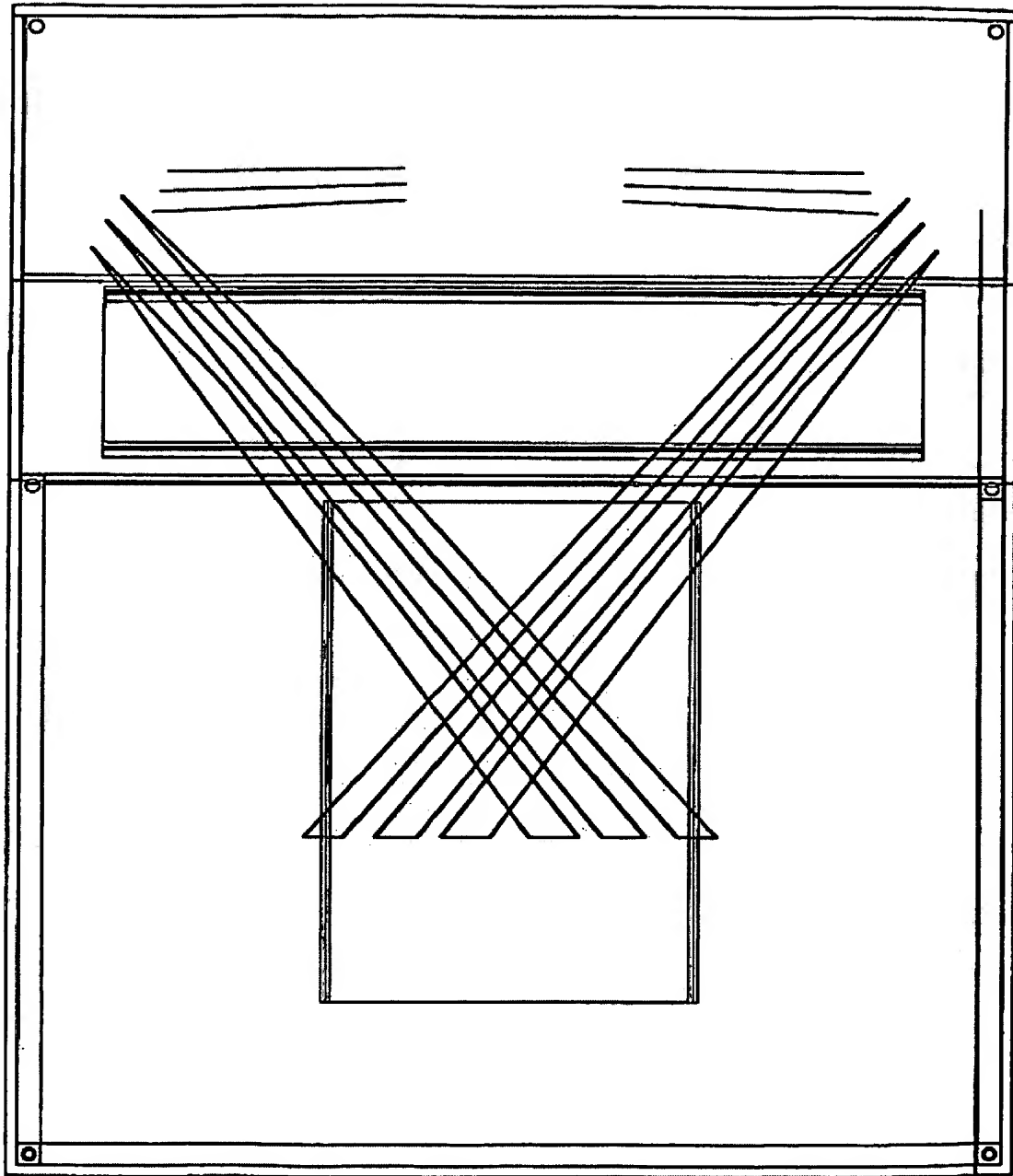
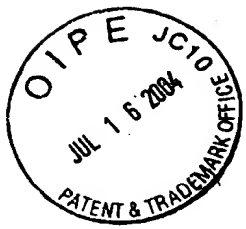


FIG. 5U2

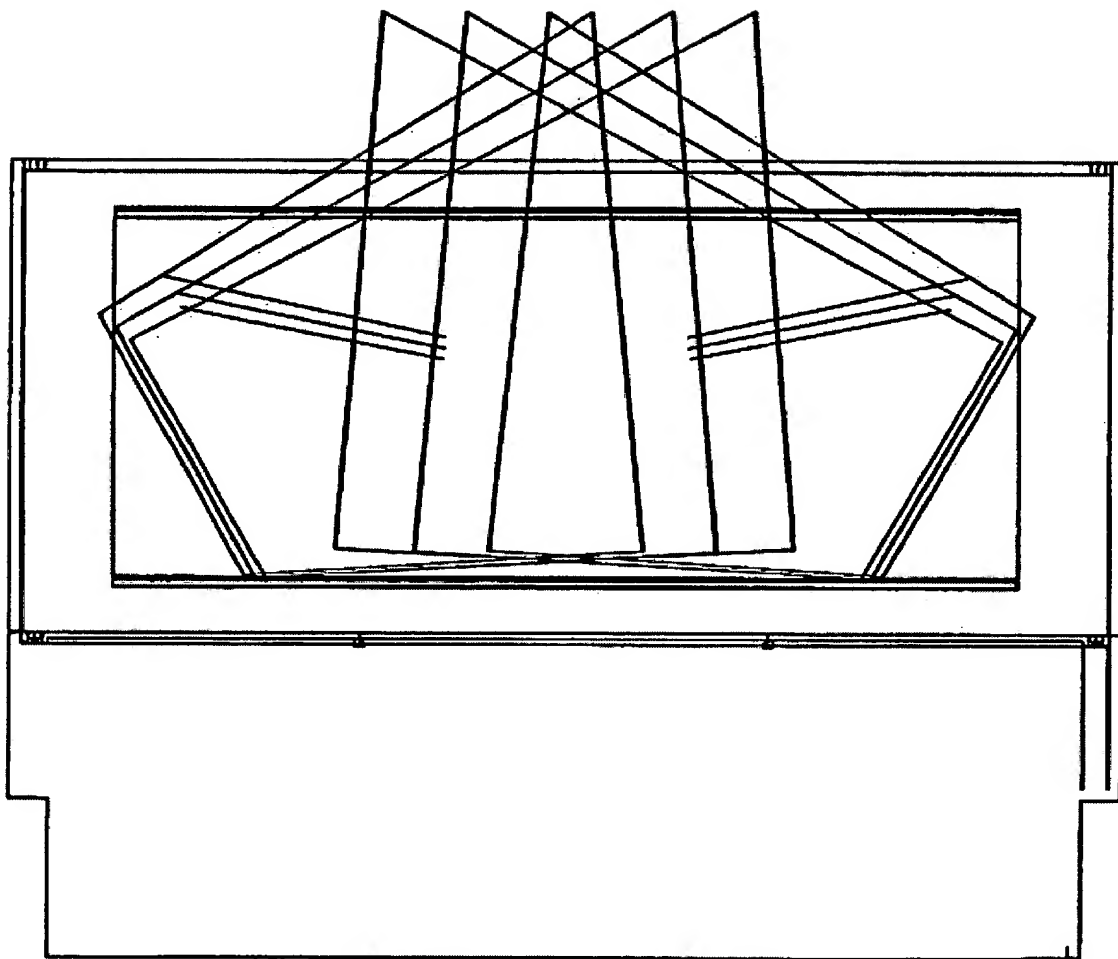
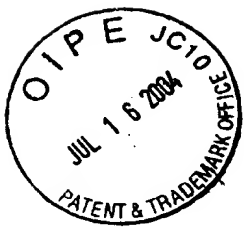


FIG. 5U3

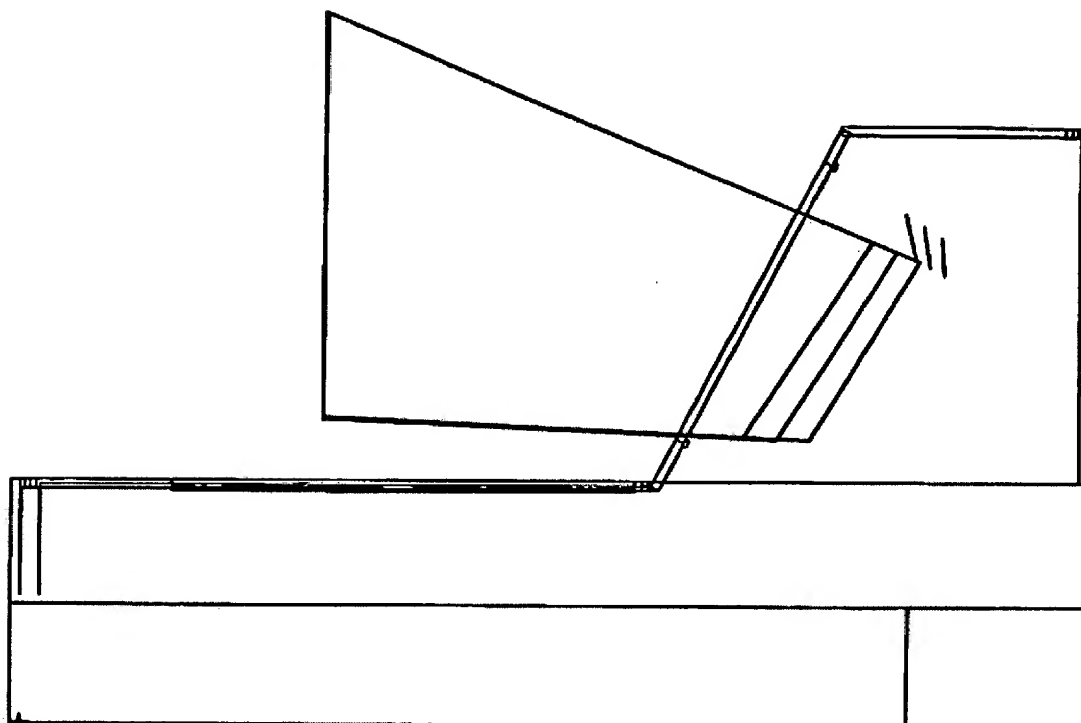
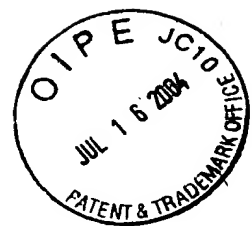


FIG. 5U4

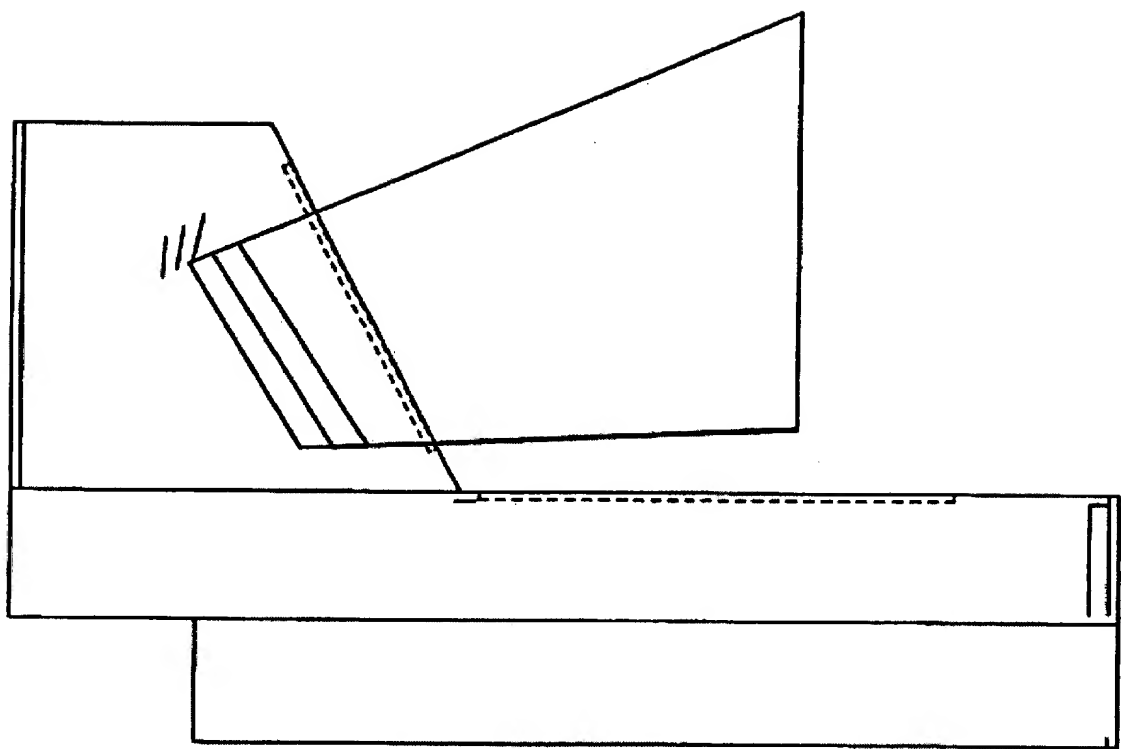
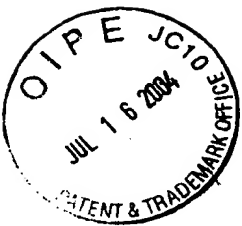


FIG. 5U5

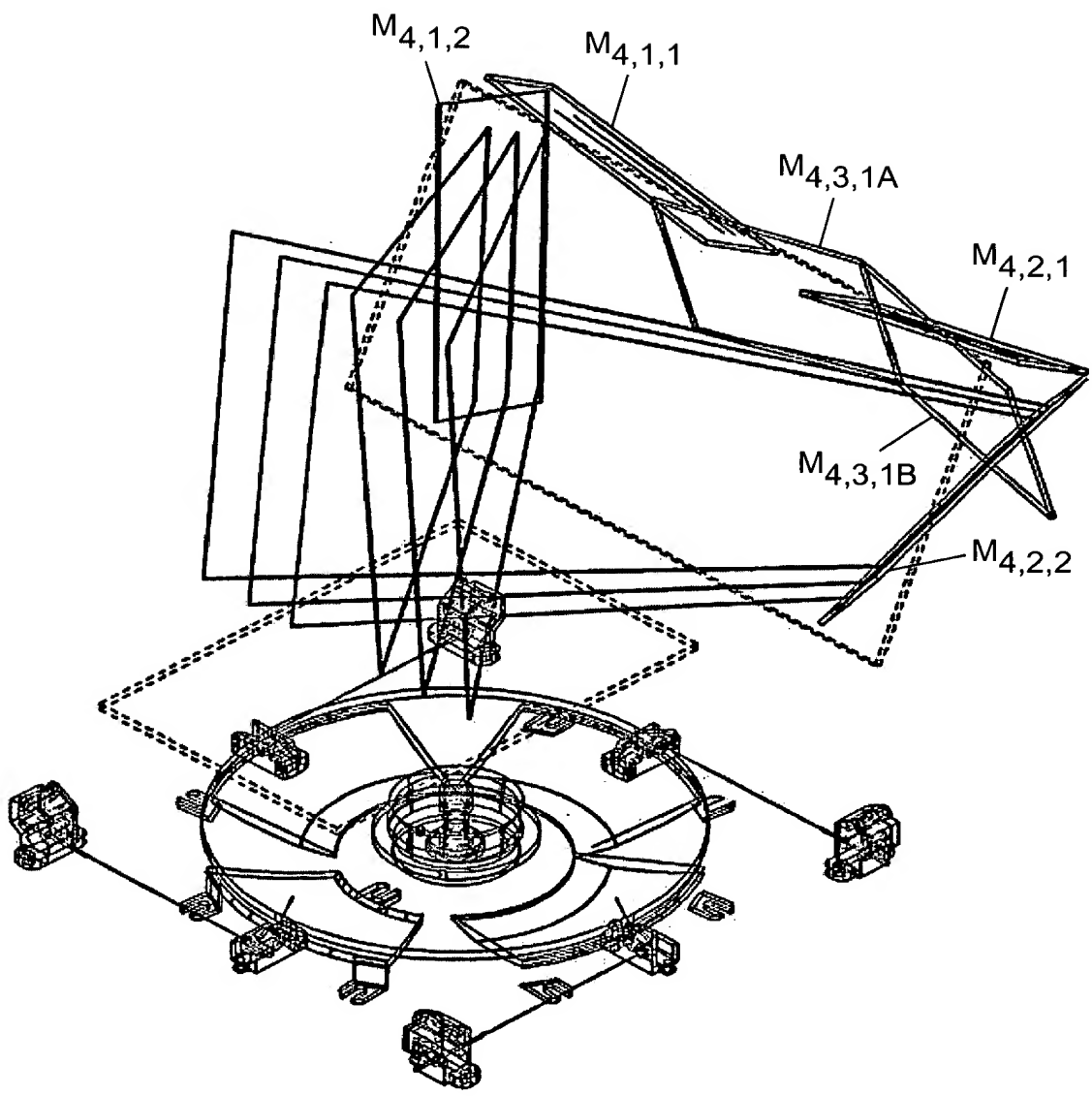


FIG. 5V1

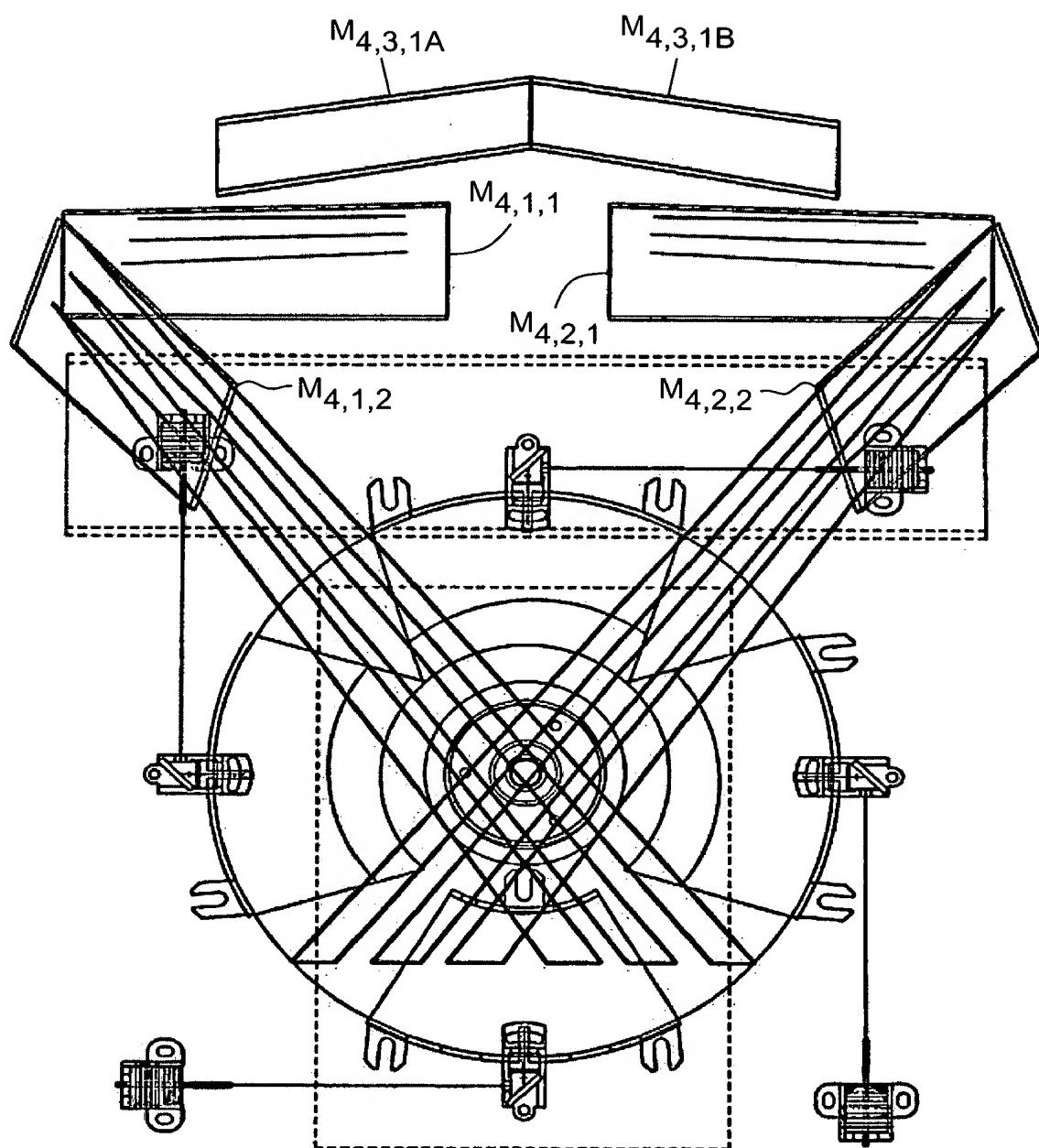


FIG. 5V2

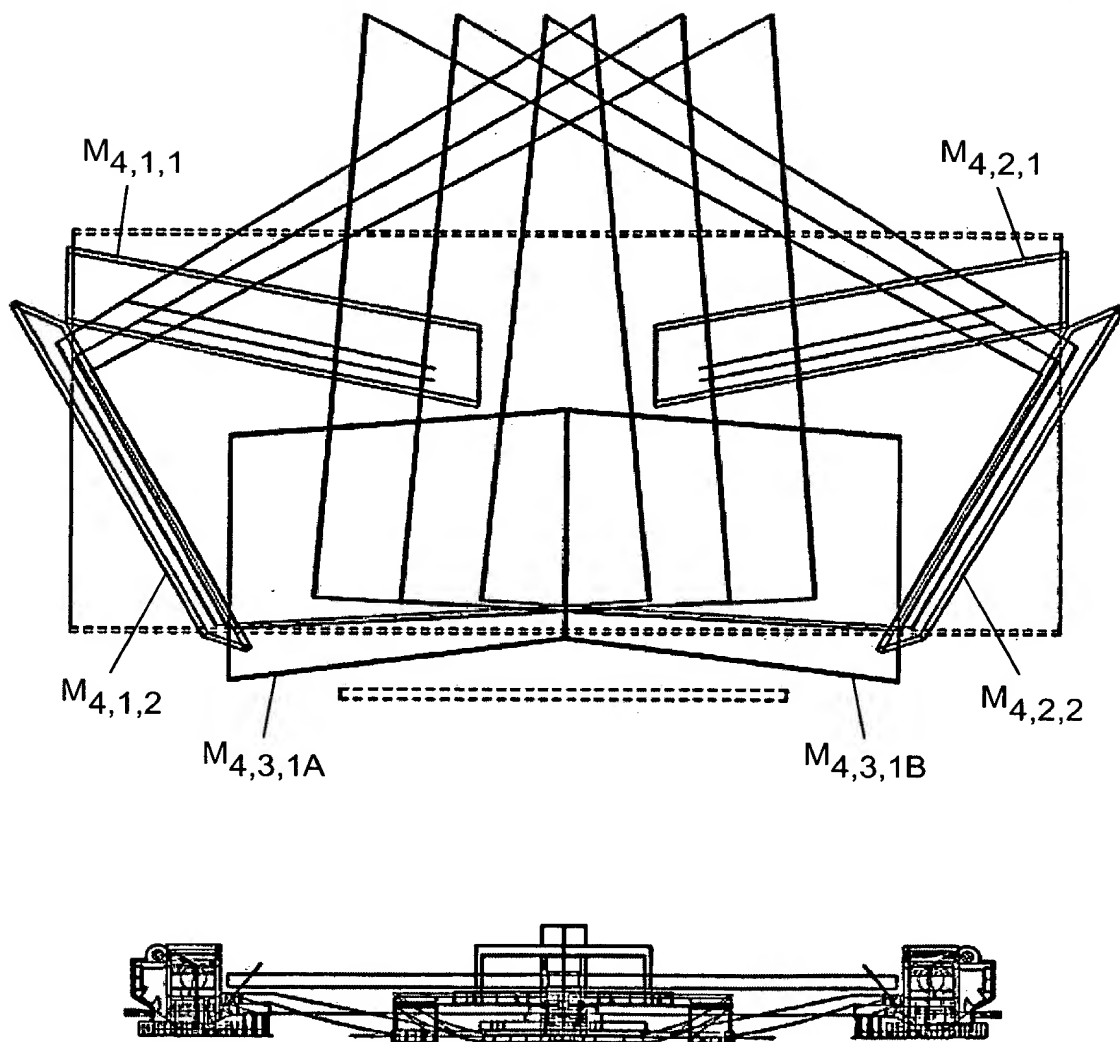


FIG. 5V3

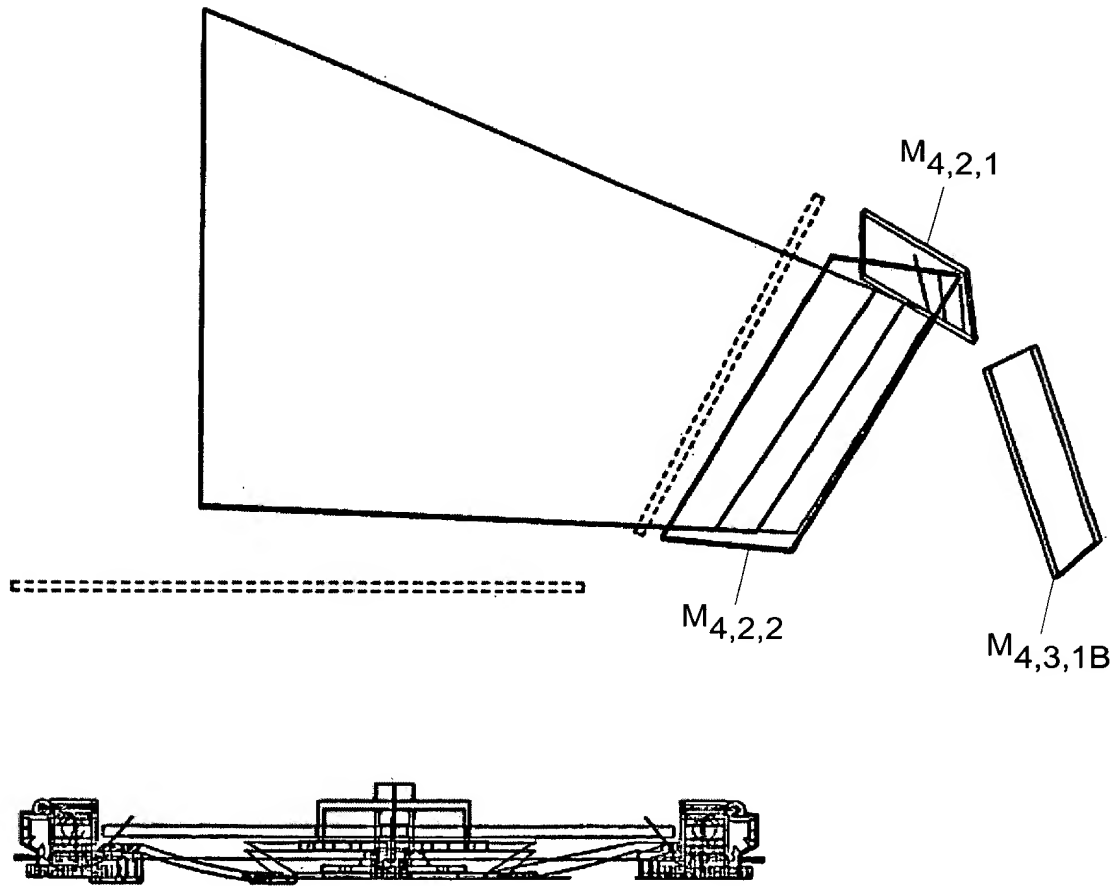
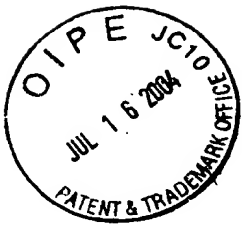


FIG. 5V4

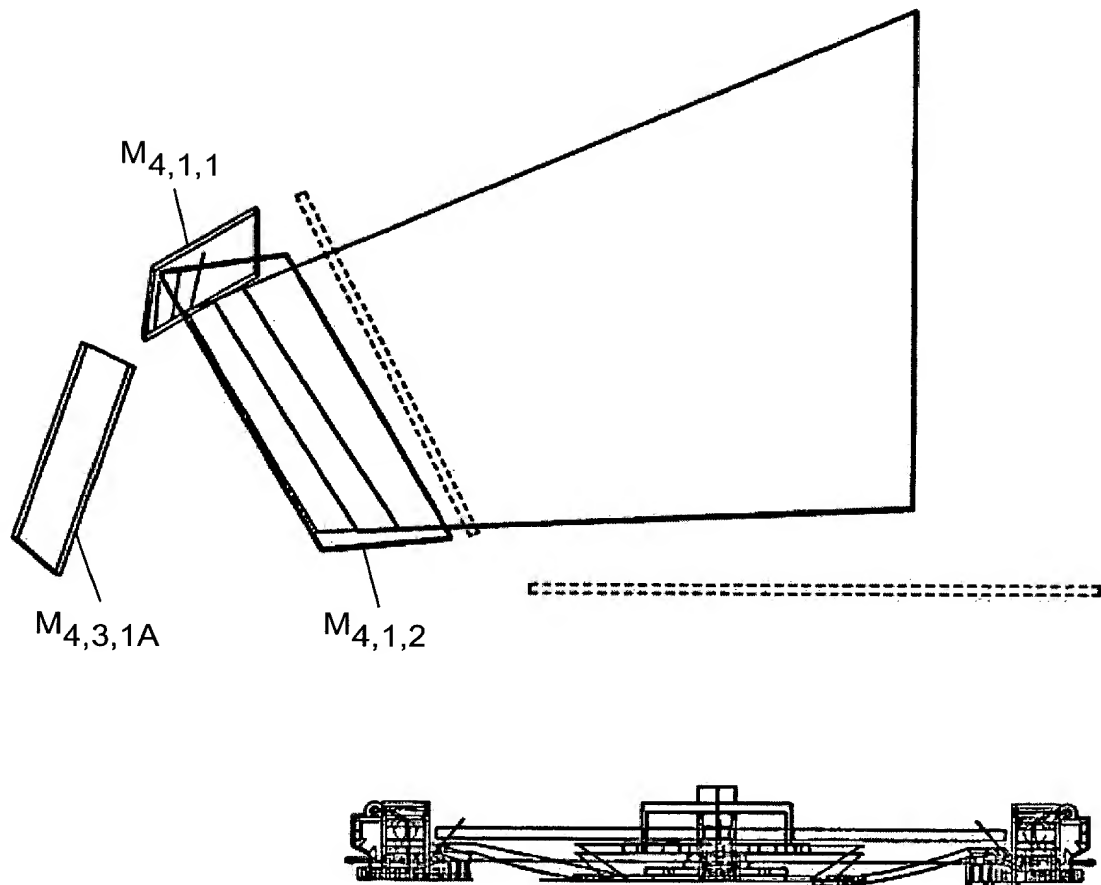
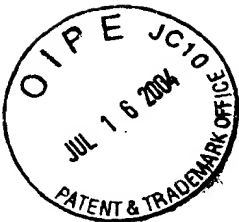


FIG. 5V5

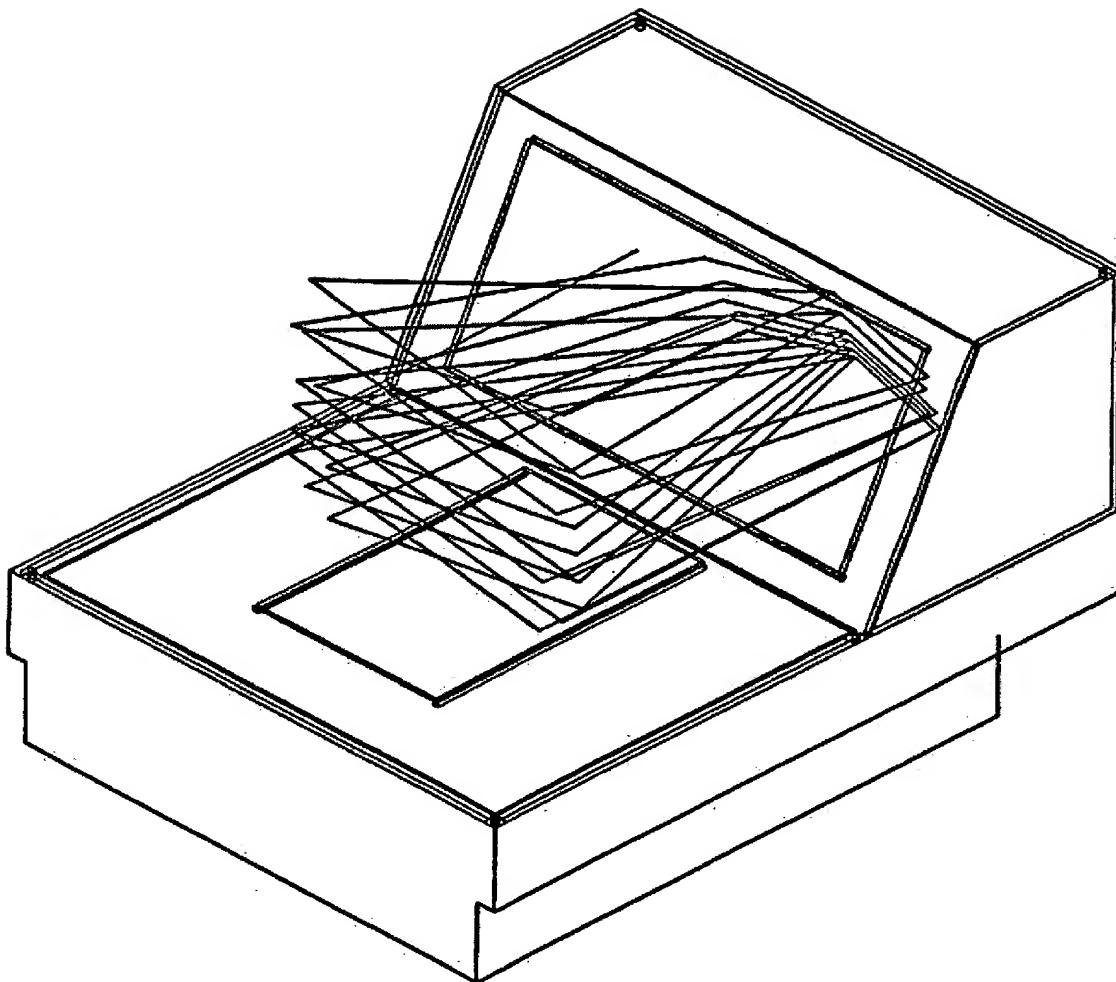
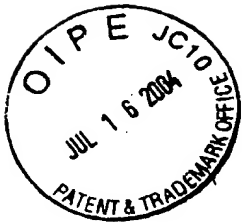


FIG. 5W1

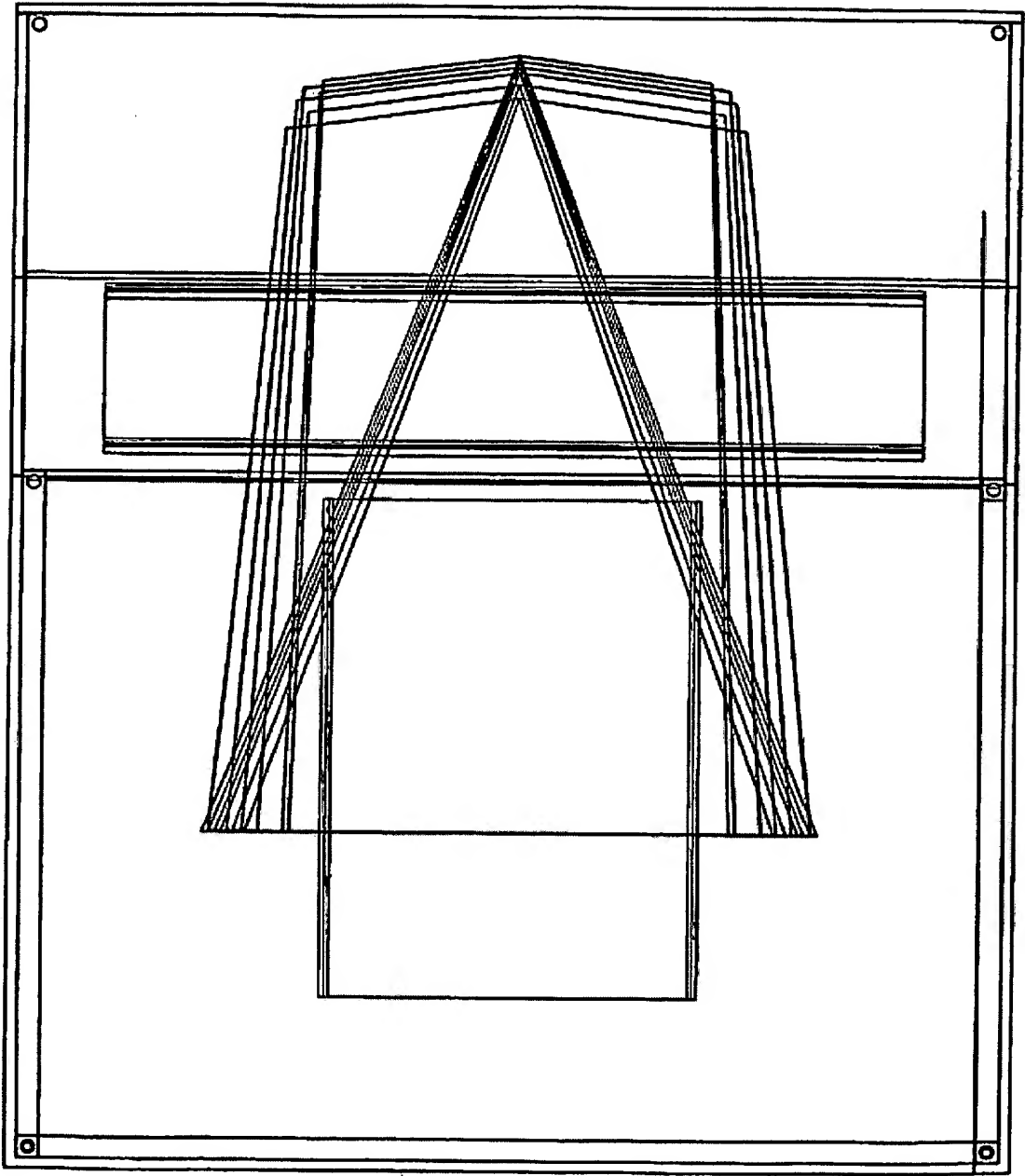
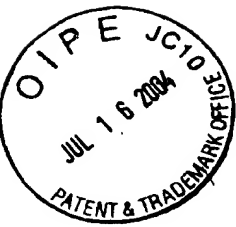


FIG. 5W2

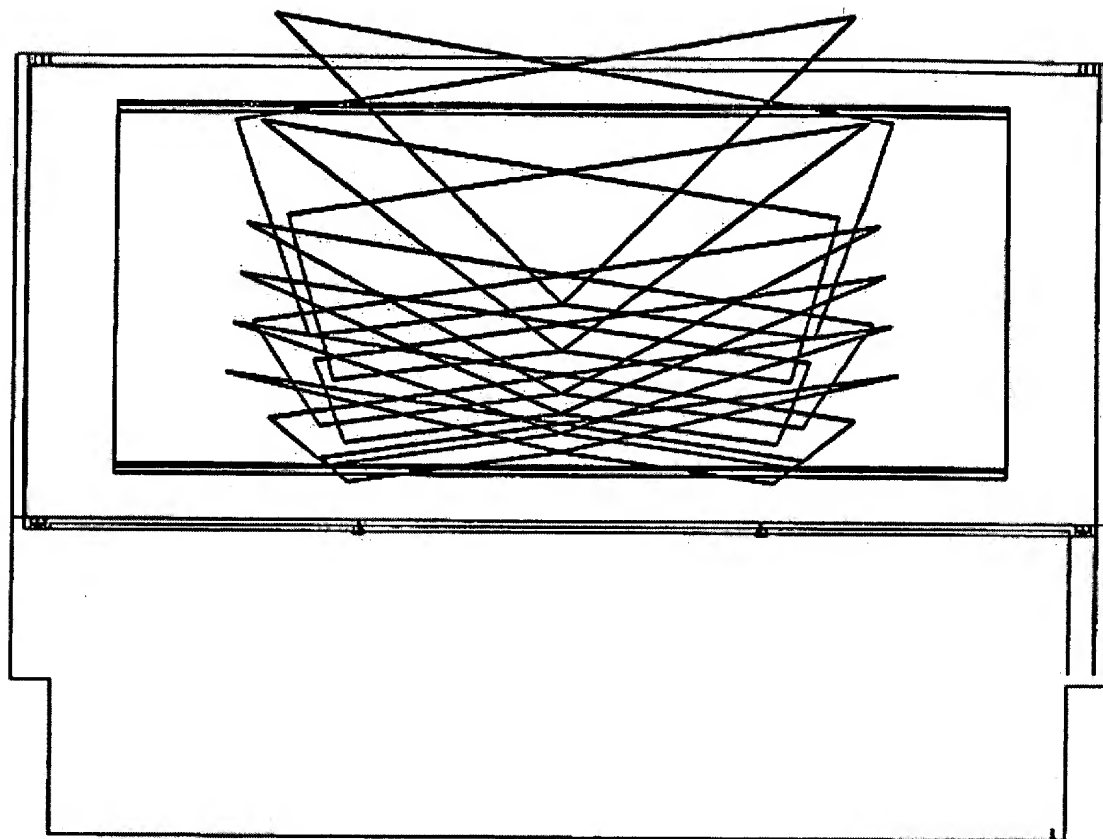
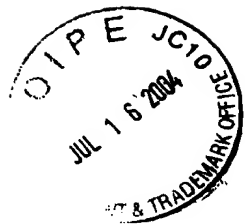


FIG. 5W3

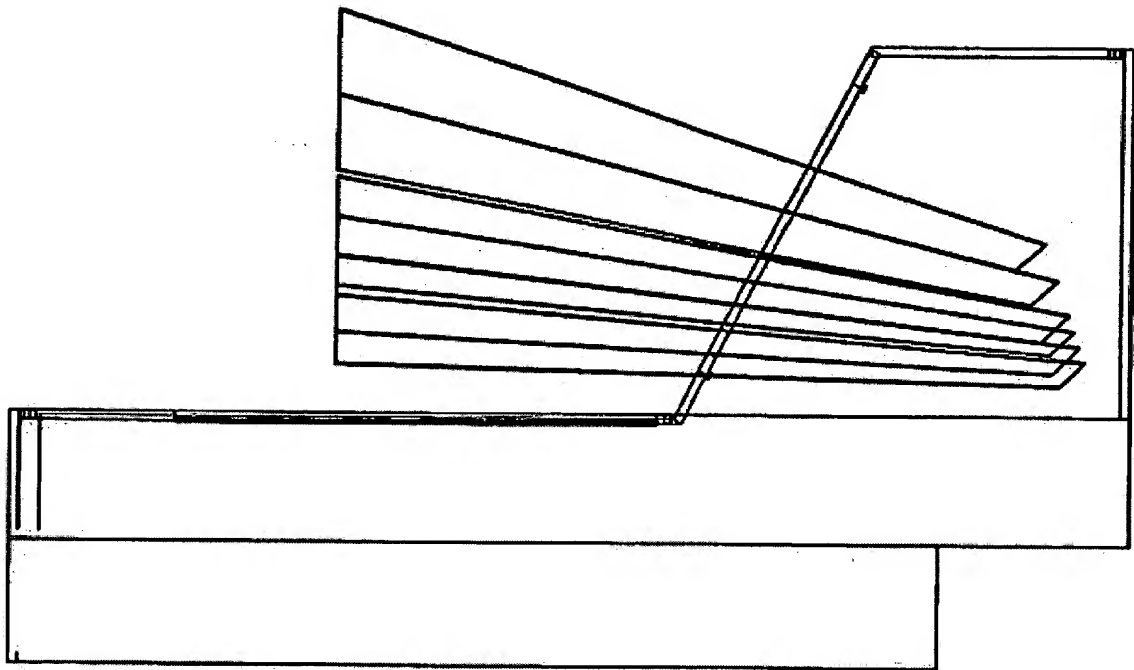
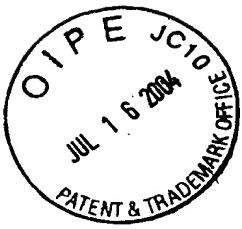


FIG. 5W4

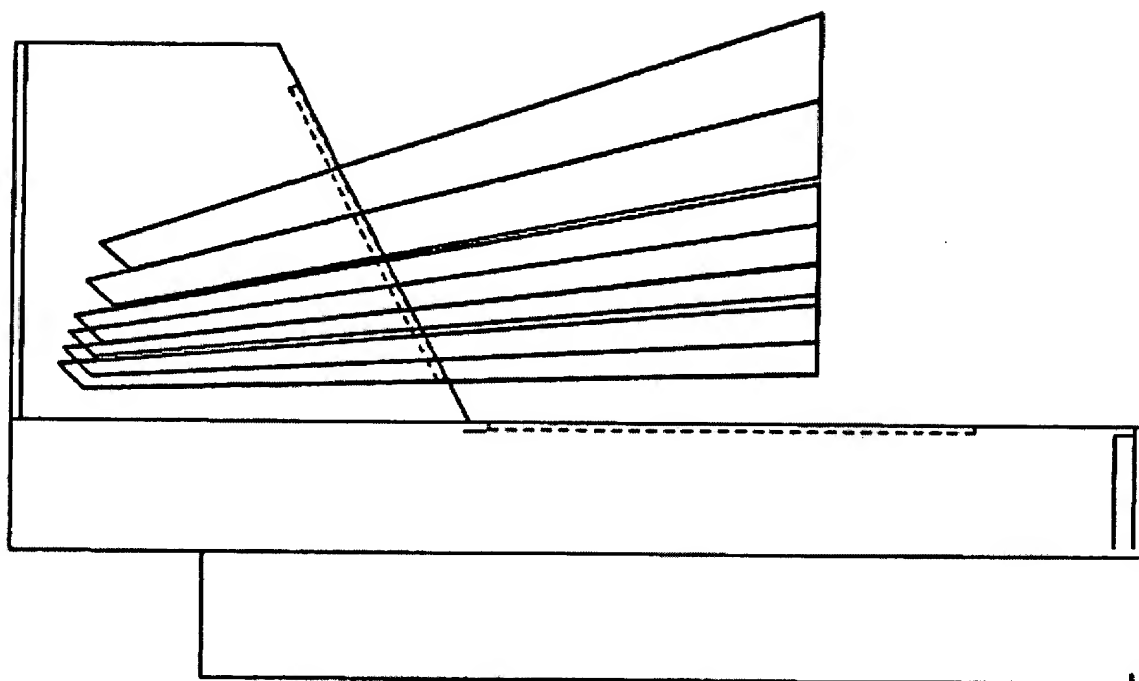


FIG. 5W5

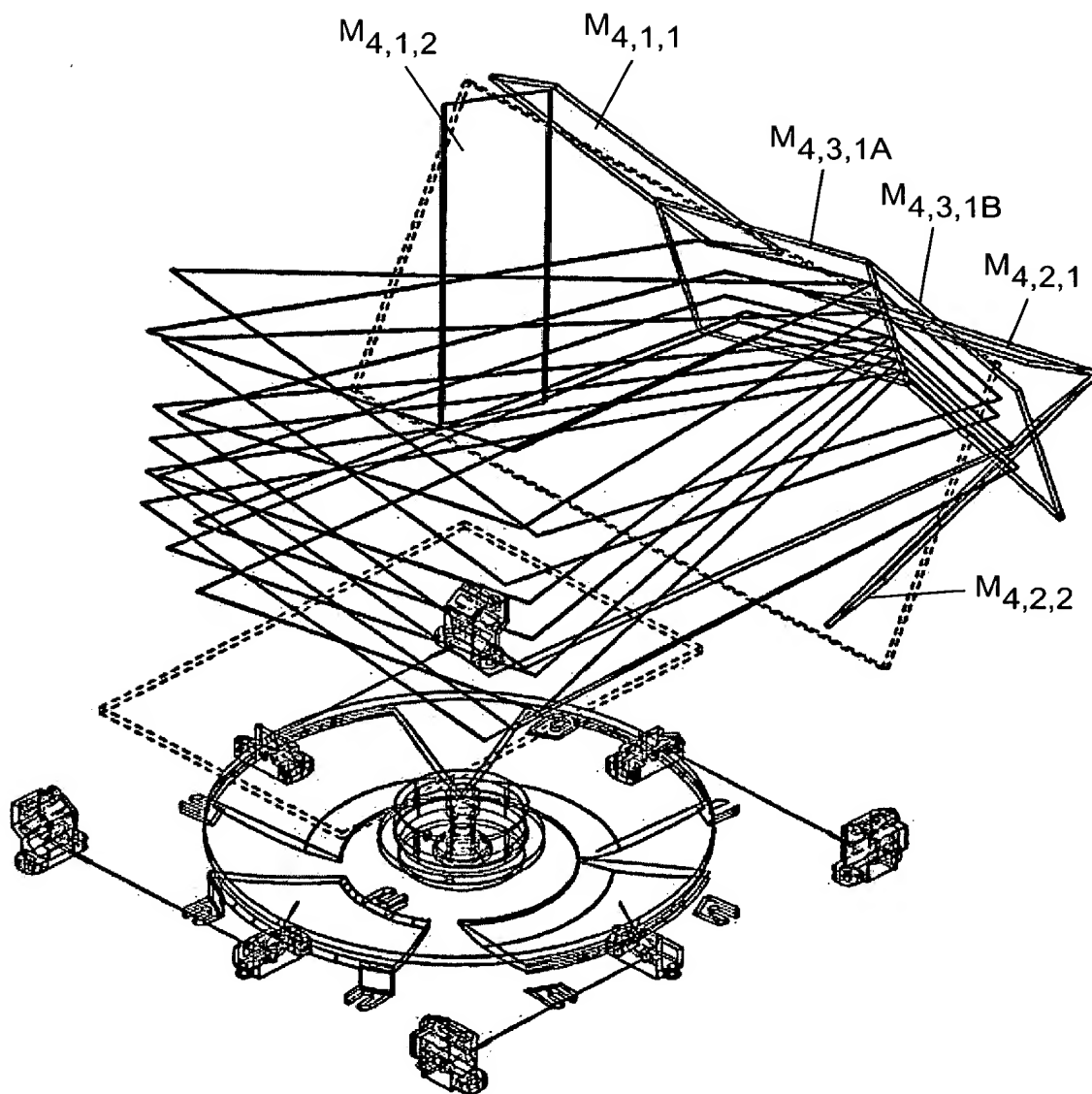


FIG. 5X1

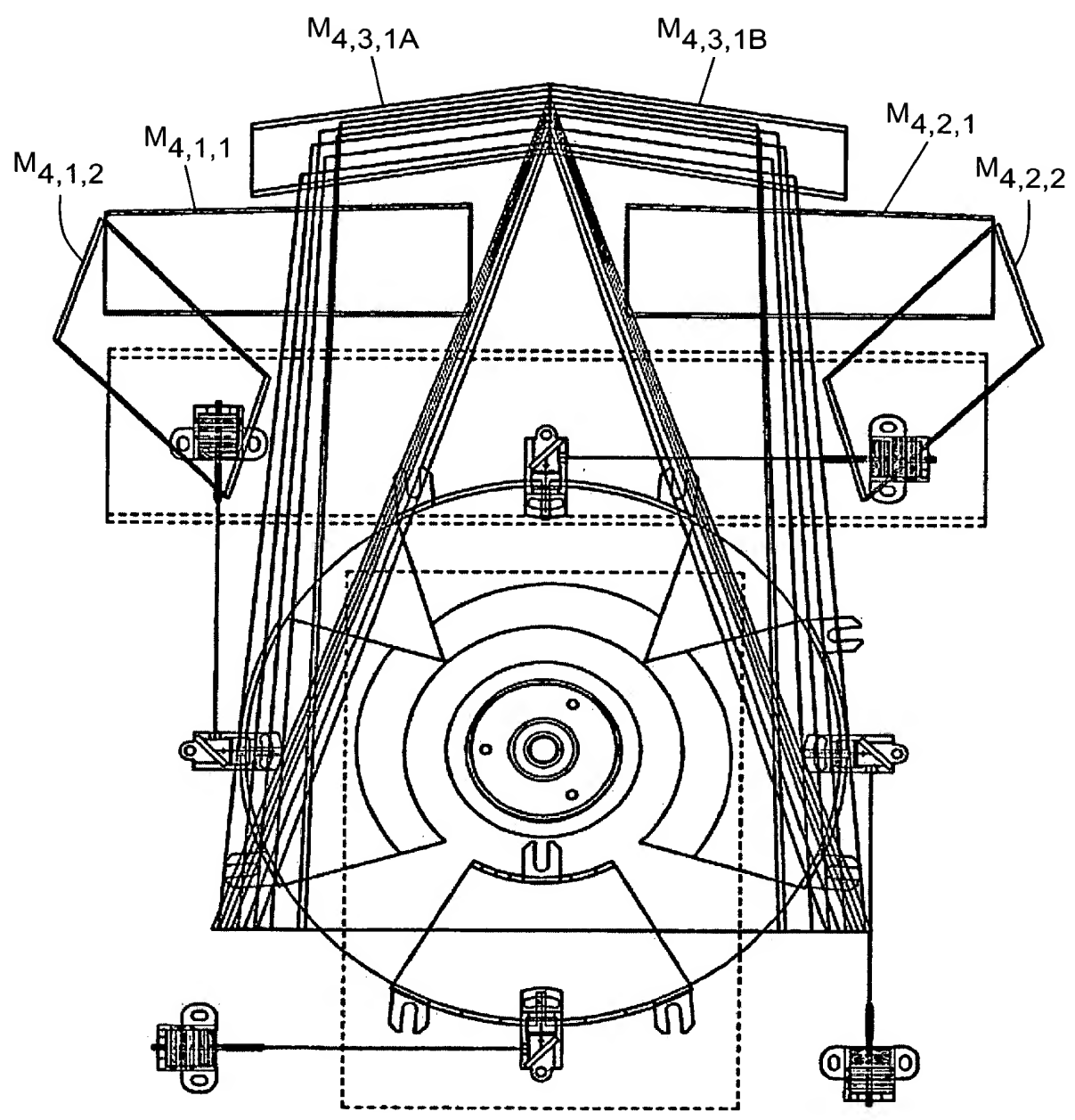
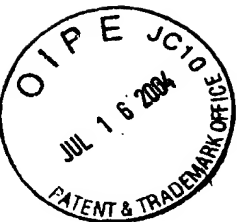


FIG. 5X2

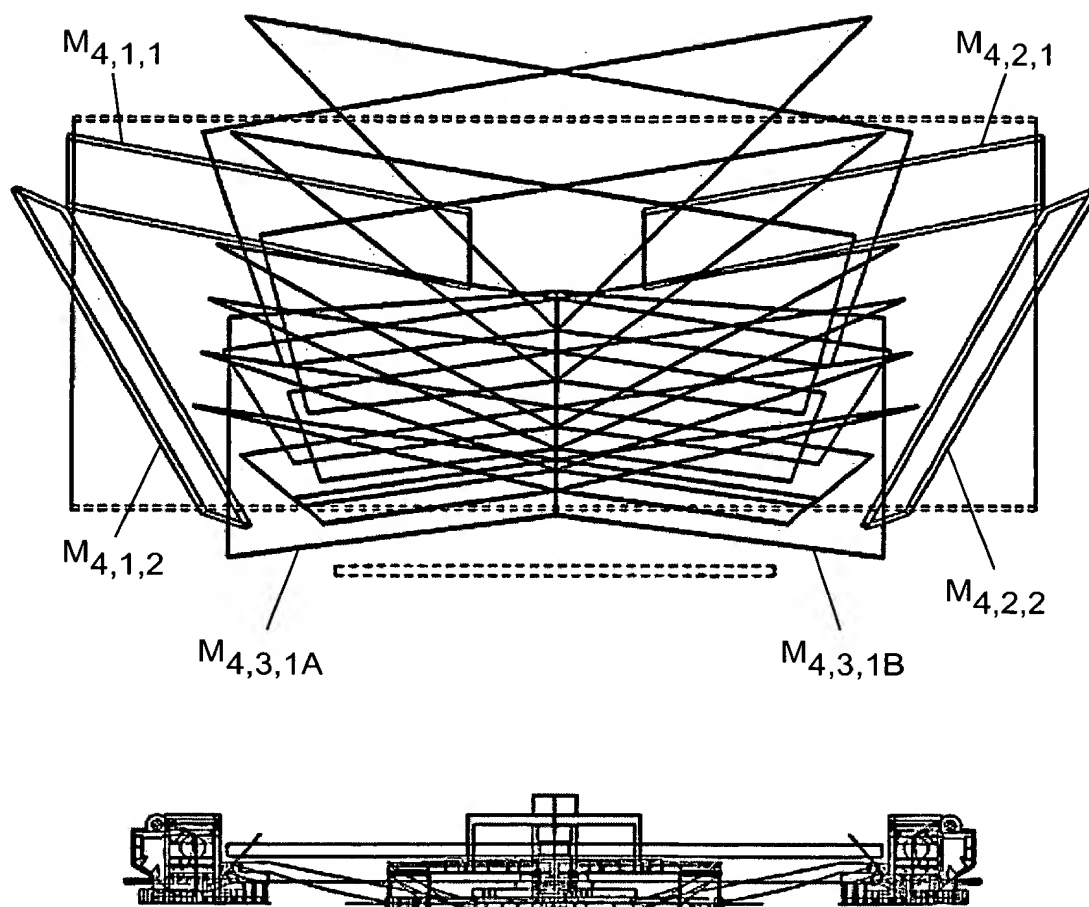


FIG. 5X3

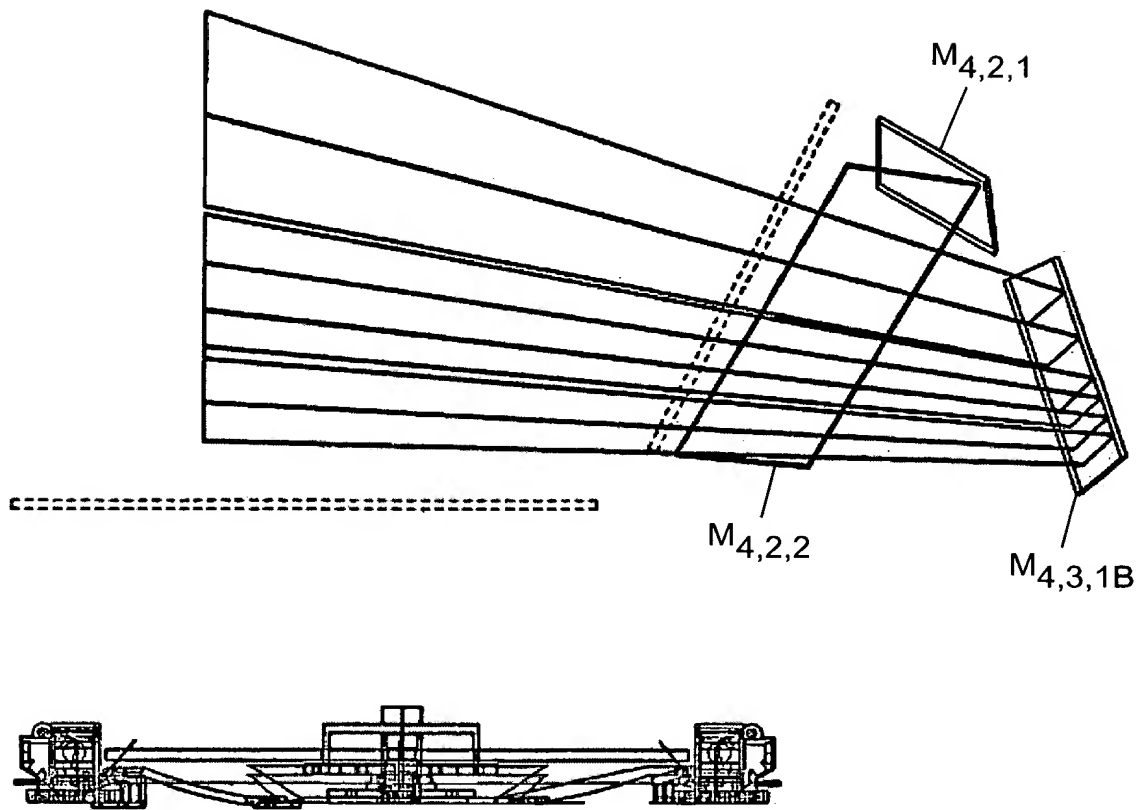
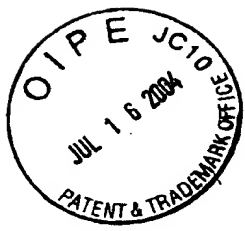


FIG. 5X4

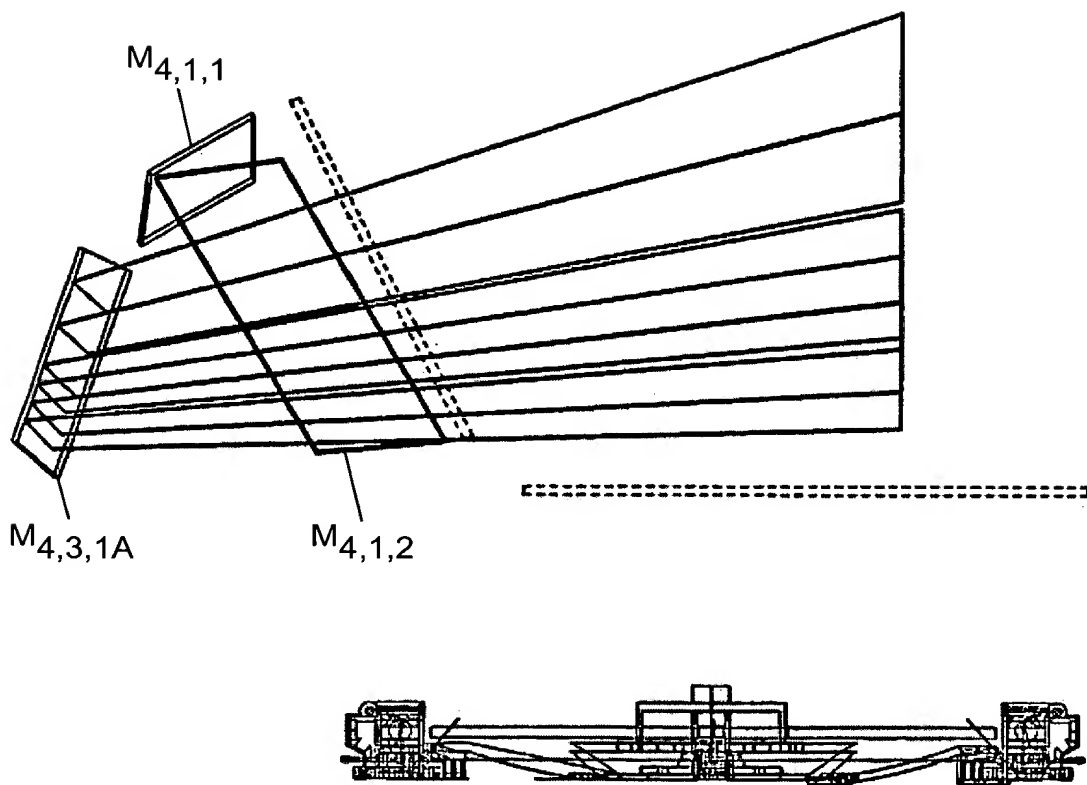
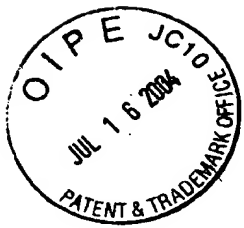


FIG. 5X5

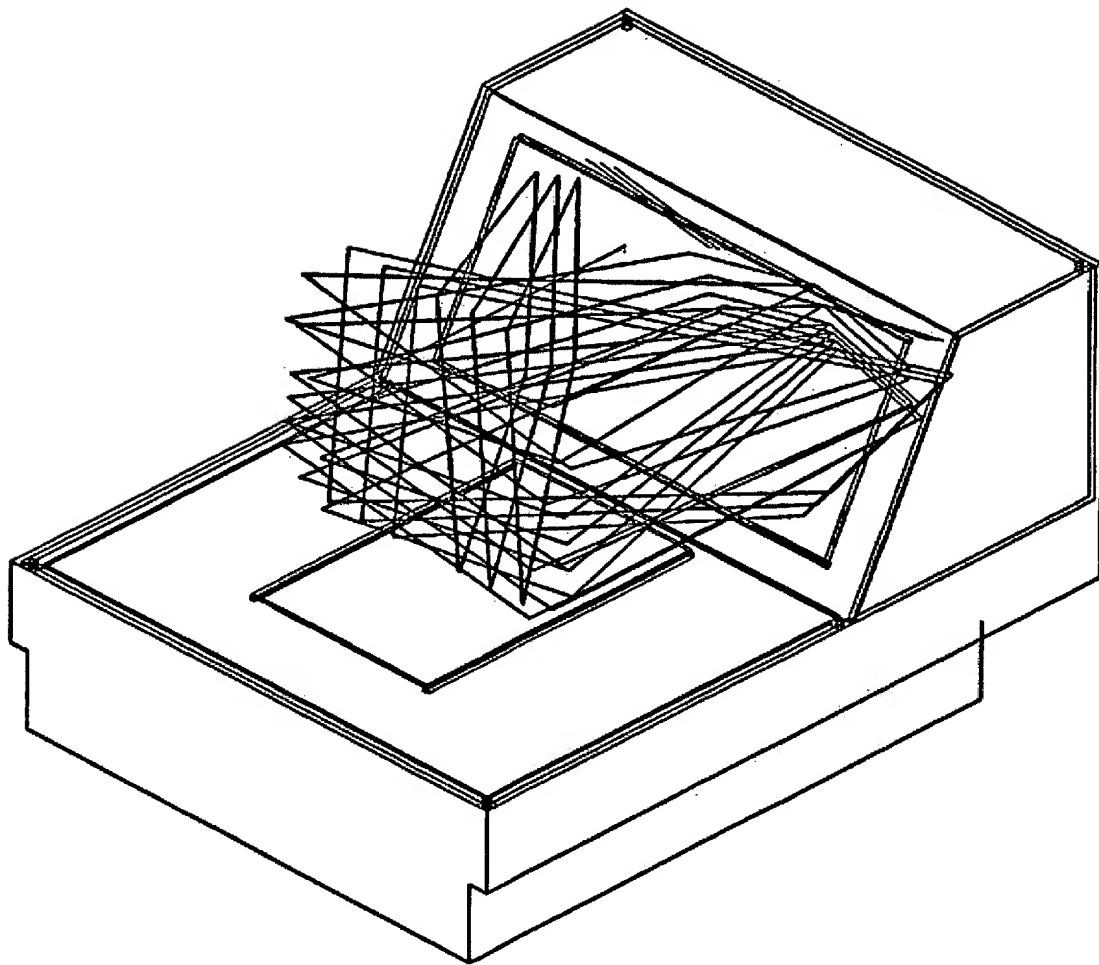
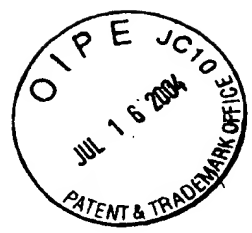


FIG. 5Y1

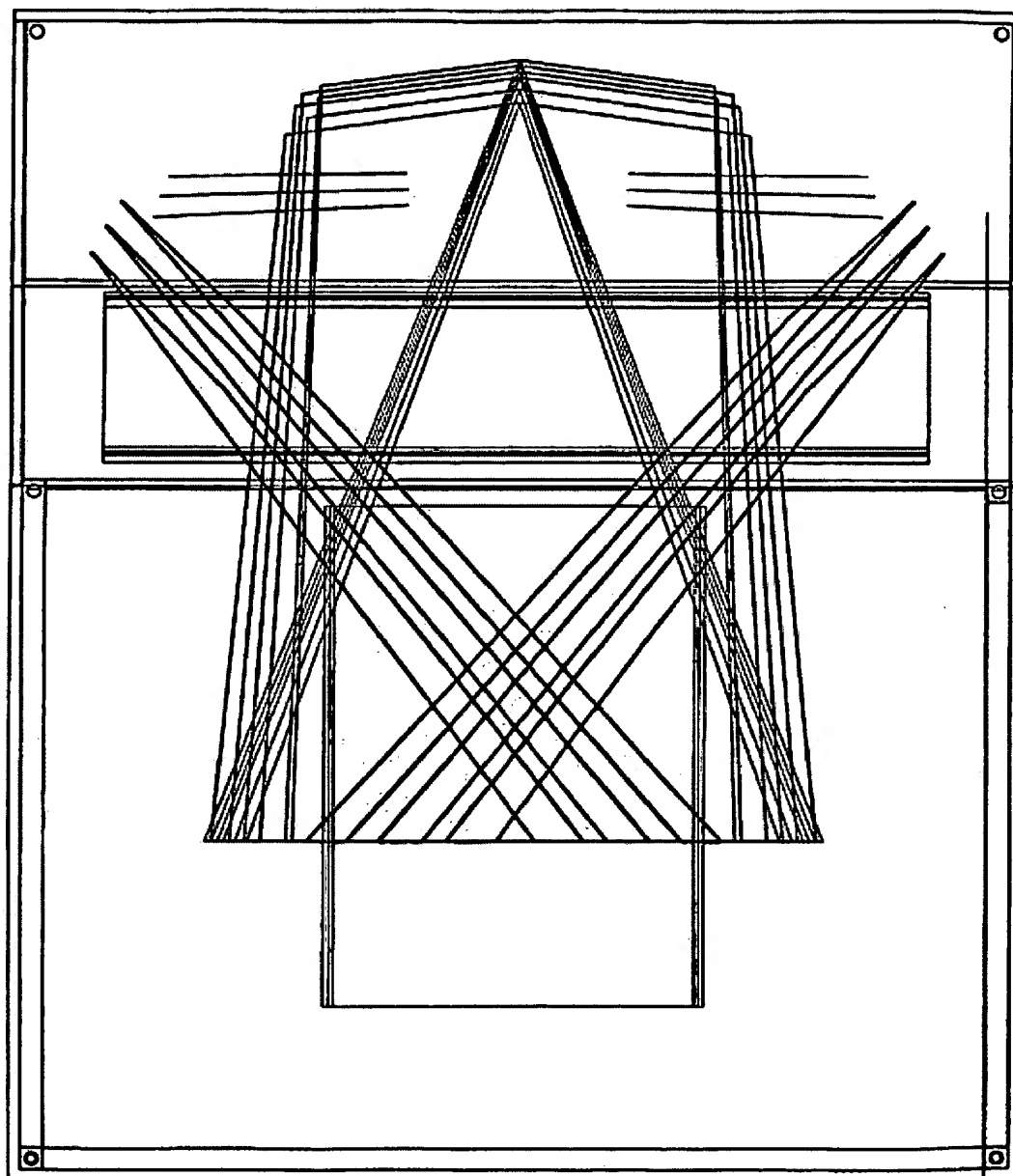
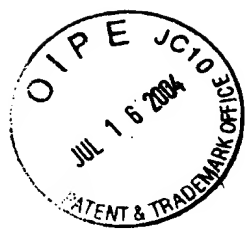


FIG. 5Y2

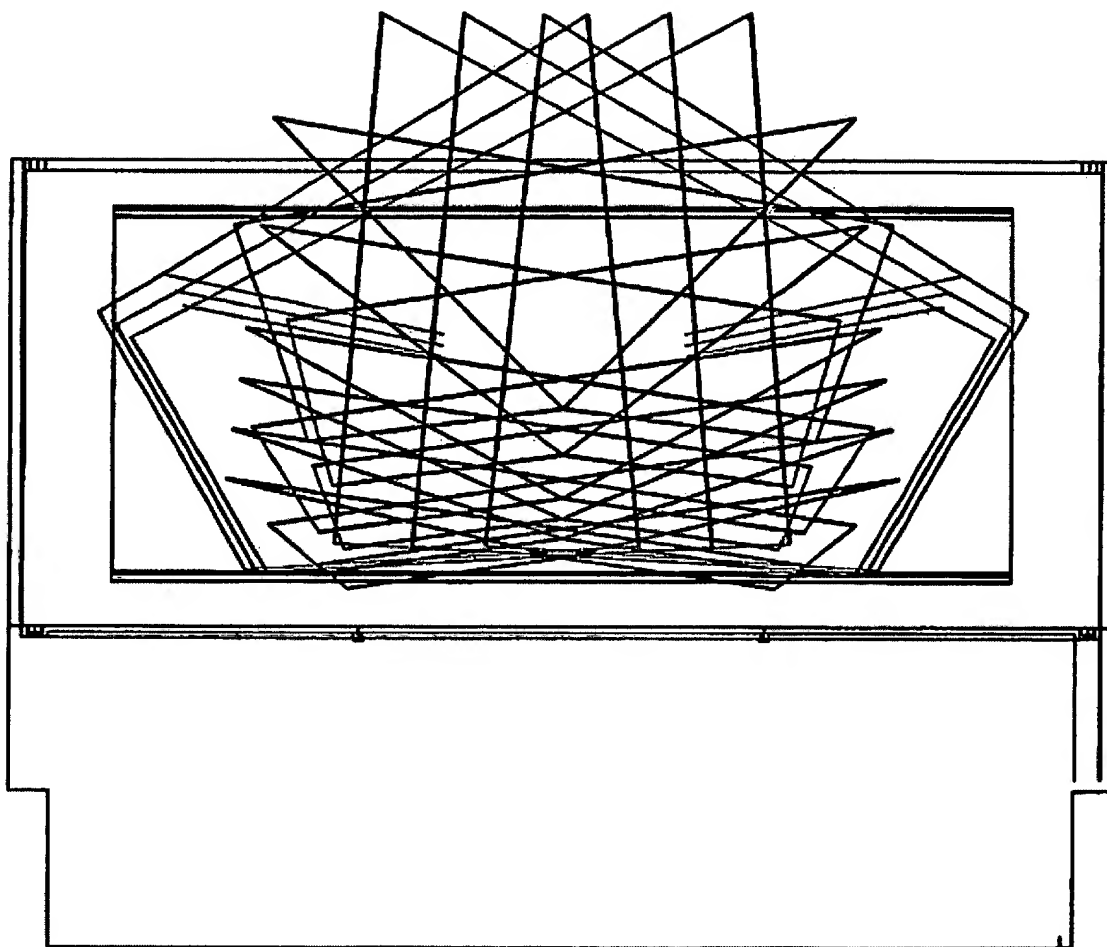
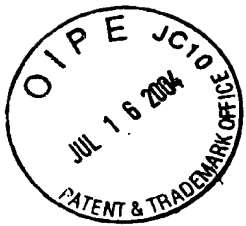


FIG. 5Y3

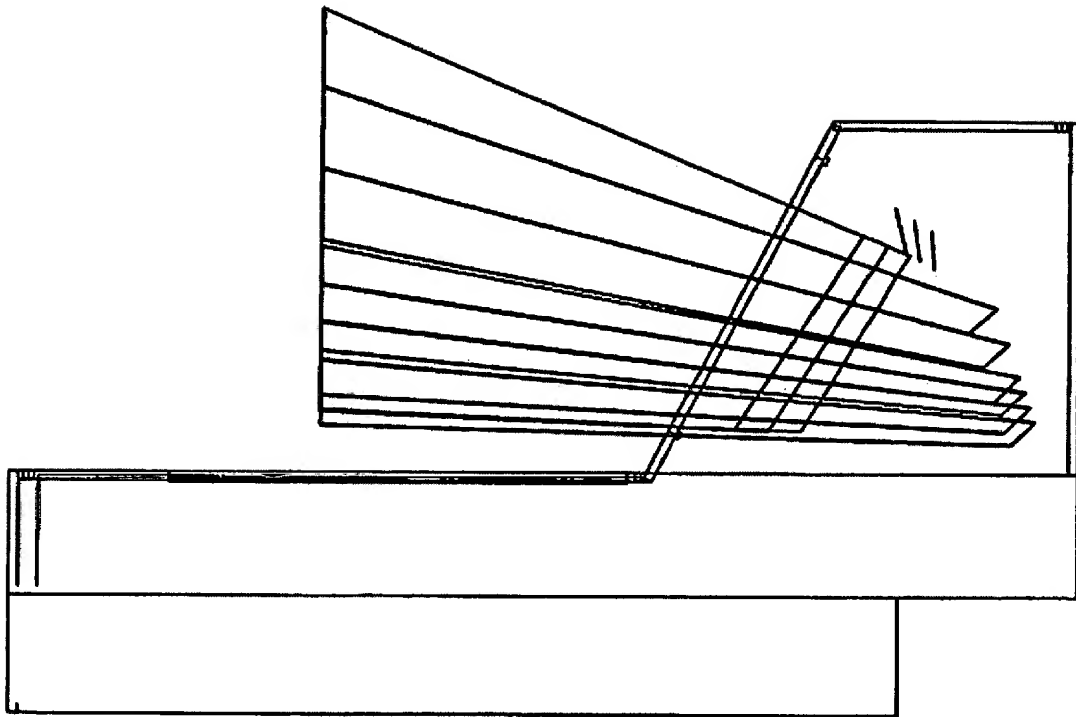
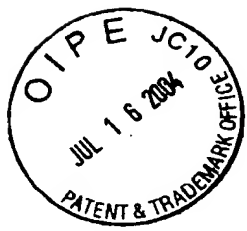


FIG. 5Y4

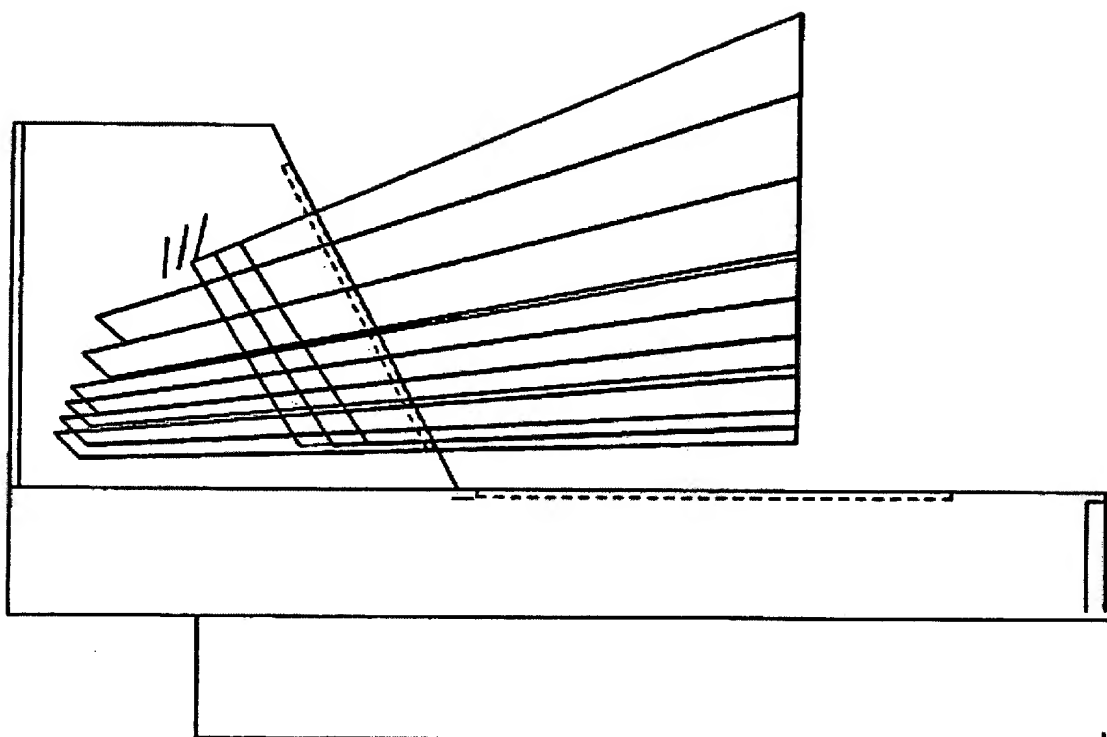
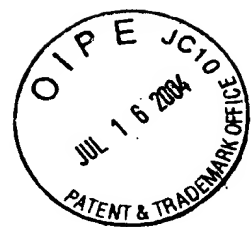


FIG. 5Y5

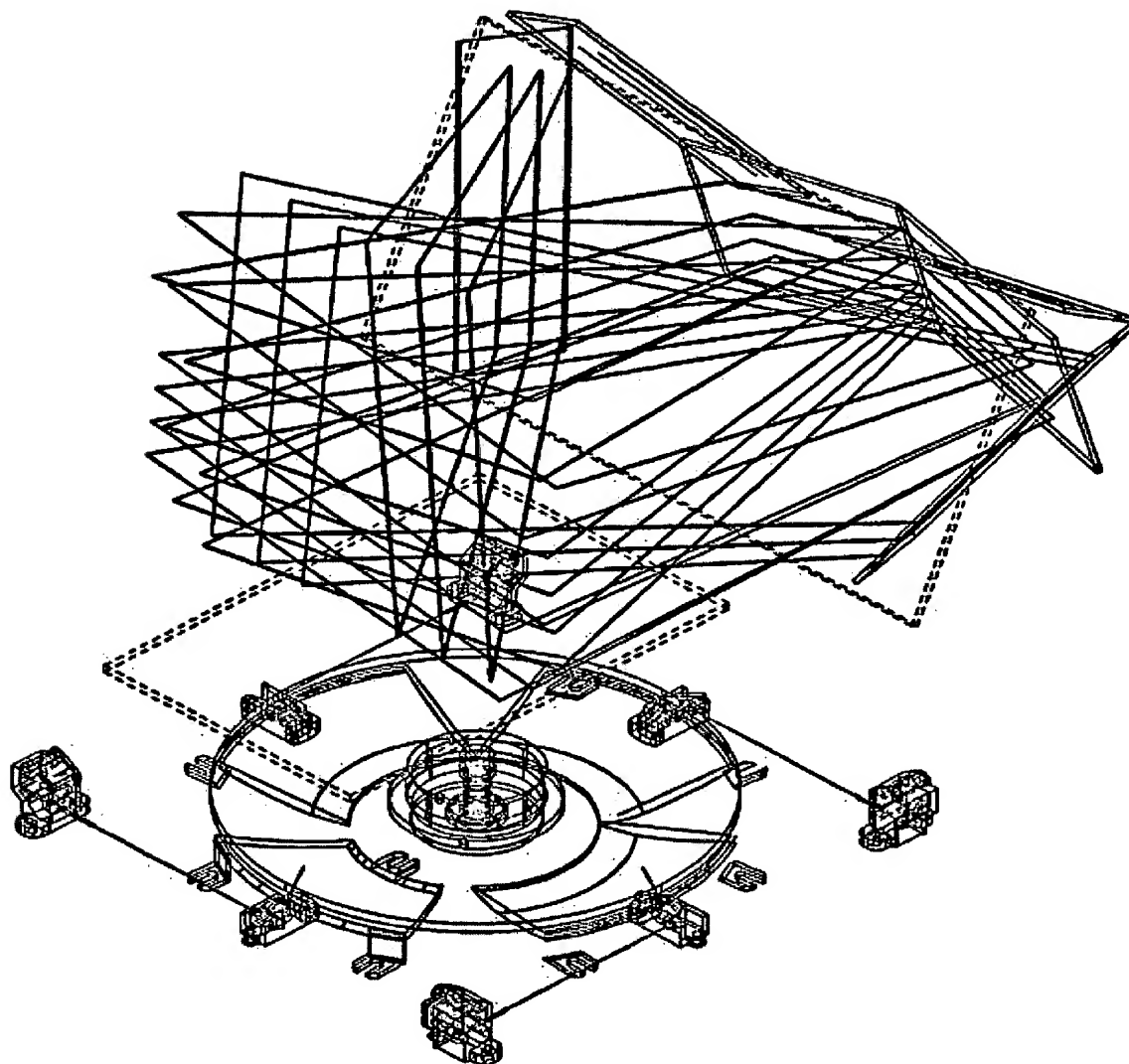
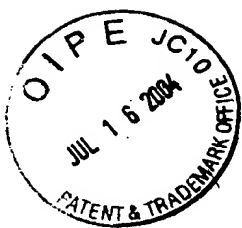


FIG. 5Z1

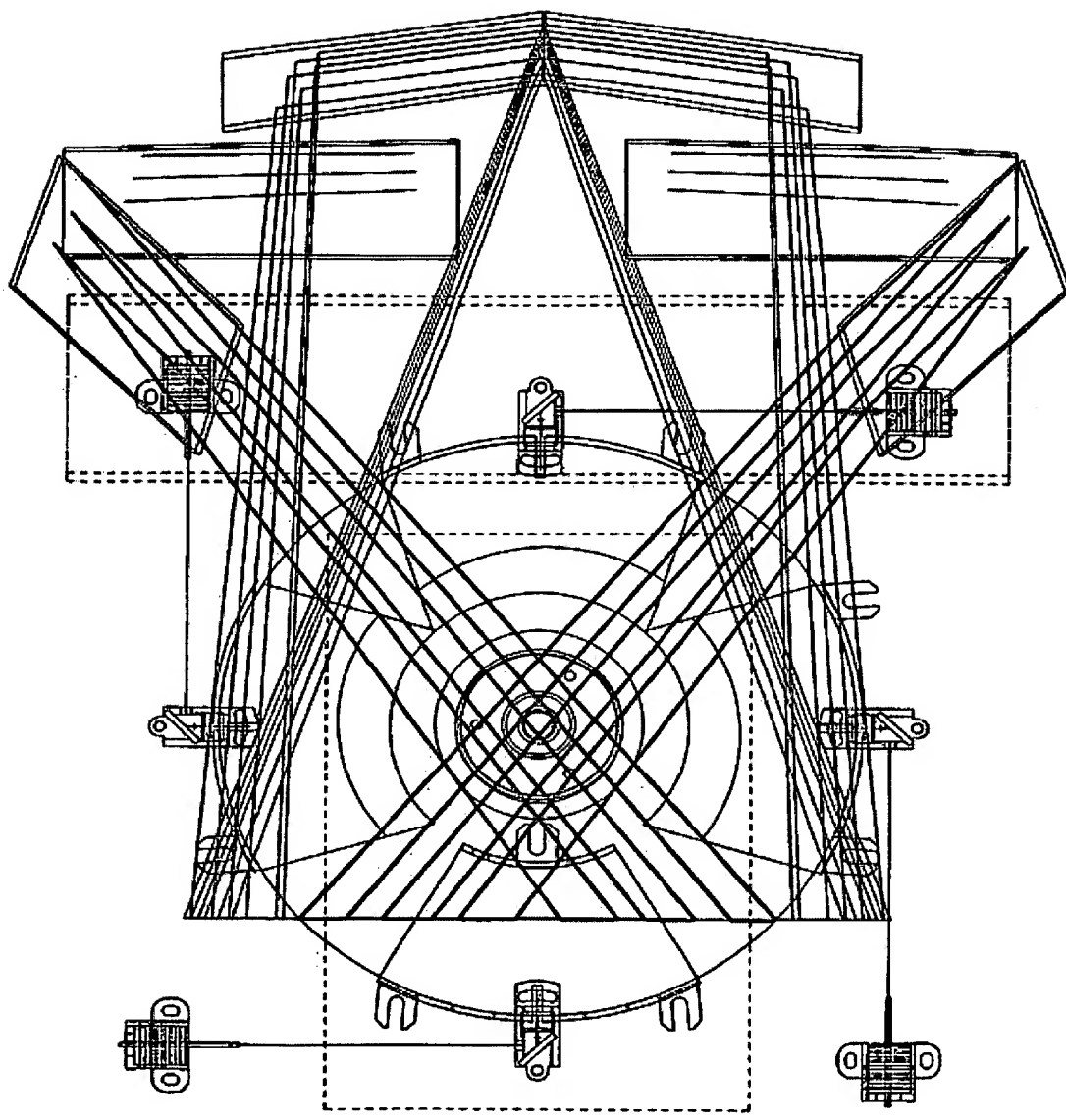
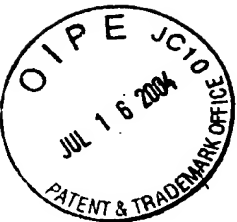


FIG. 5Z2

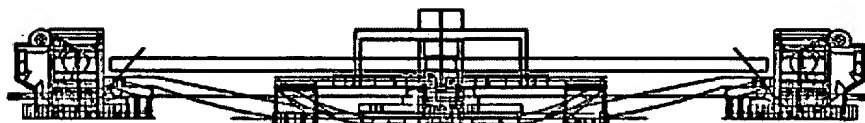
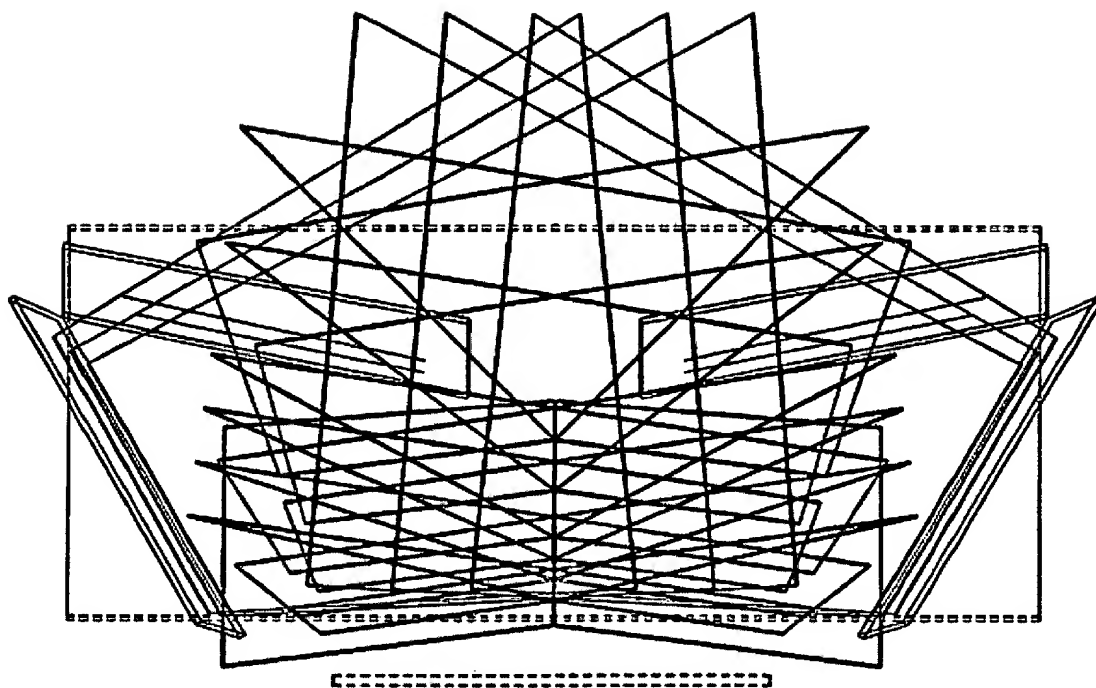
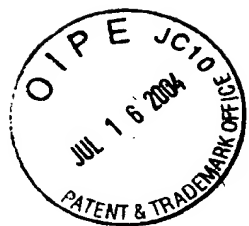


FIG. 5Z3

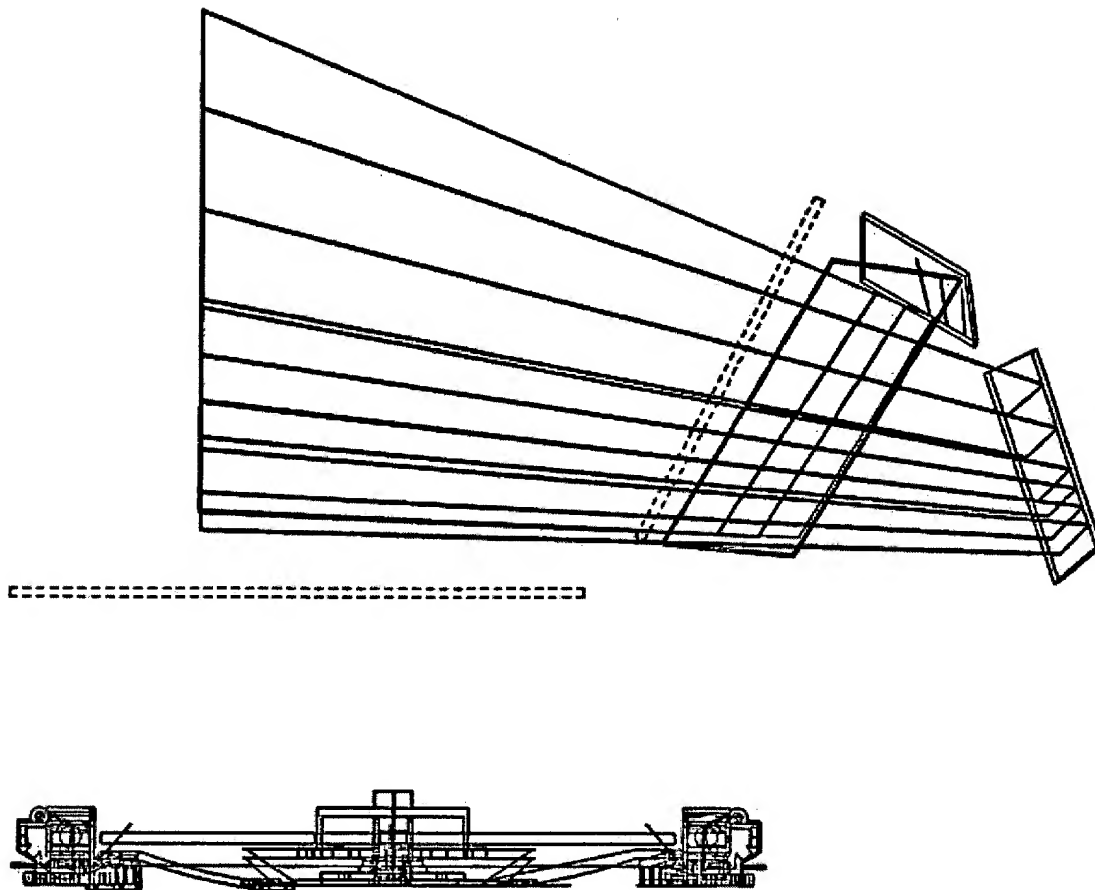
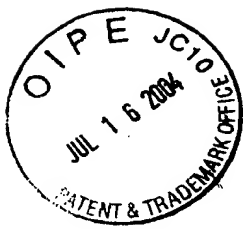


FIG. 5Z4

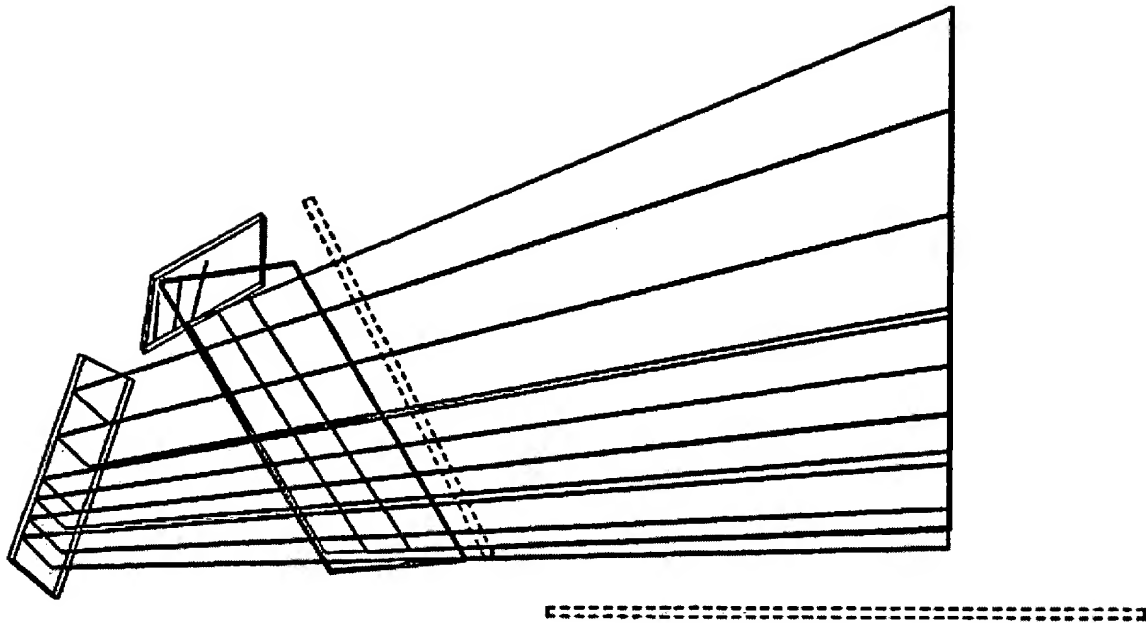
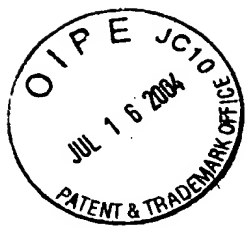


FIG. 5Z5

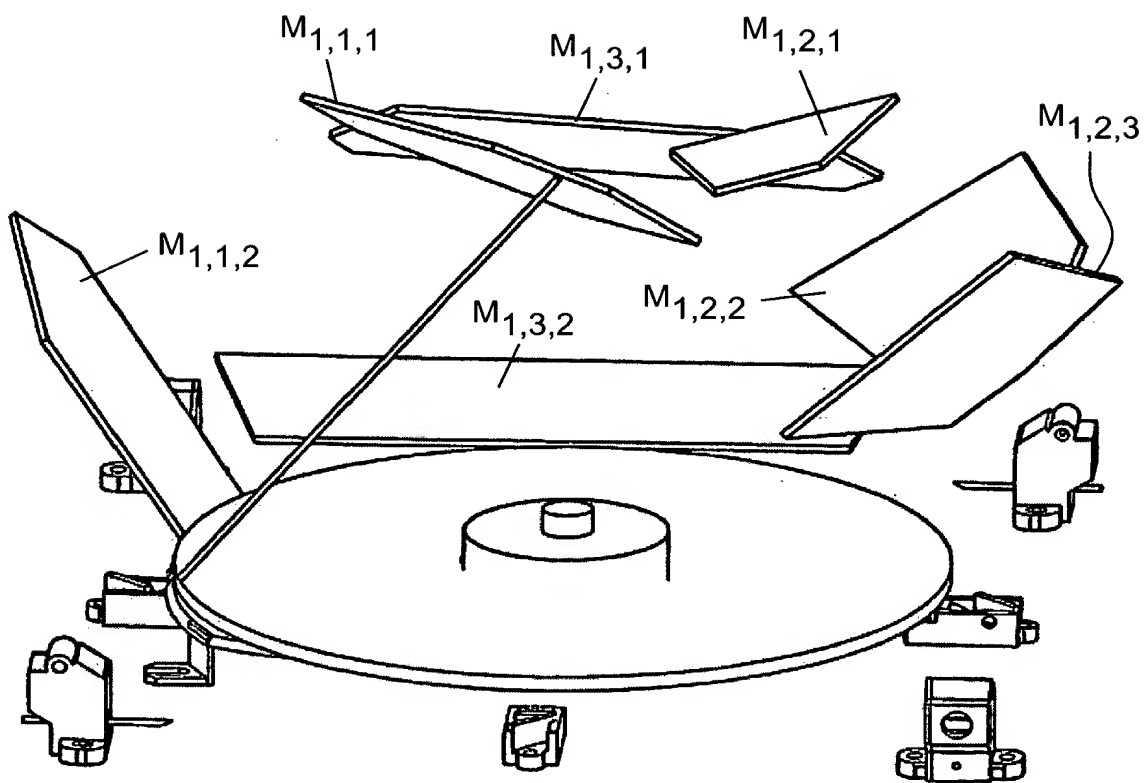


FIG. 6A1



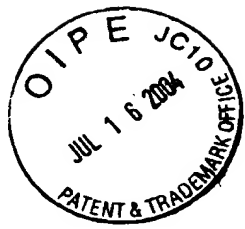
	N	O	P	Q	R	S	T	U	V	W	X
1											
2											
3											
4	Facet	7									
5	x	y	z								
6	-0.616	0.000	0.788								
7	End			Middle			End				
8	x	y	z		x	y	z		x	y	z
9	0.419	0.416	0.807		0.468	0.249	0.848		0.494	0.048	0.868
10	-0.253	0.917	-0.310		-0.316	0.832	-0.455		-0.387	0.704	-0.596
11	-0.469	-0.414	0.781		-0.537	-0.527	0.659		-0.603	-0.626	0.494
12											
13											
14	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
15	x	y	z		x	y	z		x	y	z
16	3.900	2.436	2.770		1.700	4.102	1.300				
17	4.100	1.879	2.400		3.300	4.400	1.980				
18	3.800	0.137	1.800		3.400	3.990	1.500				
19	3.150	-0.737	1.800		2.300	2.427	-0.625				
20	2.500	-0.159	2.450		1.700	2.524	-0.625				
21	2.650	0.757	2.770		1.050	3.101	-0.050				
22											
23											
24											

FIG. 6A2



	A	B	C	D	E	F	G	H	I	J	K	L
1	Station 1											
2												
3												
4	High Elevation Left Skew	Facet	9									
5	(G2)	x	y	z								
6	Vector from Module	-0.616	0.000	0.788								
7		End				Middle				End		
8		x	y	z		x	y	z		x	y	z
9	Output Vectors From Disk	0.378	0.445	0.812		0.441	0.235	0.866		0.464	0.068	0.883
10	First Mirror Reflected Directions	-0.269	0.927	-0.263		-0.349	0.823	-0.448		-0.408	0.717	-0.565
11	Second Mirror Reflected Directions	-0.479	-0.367	0.797		-0.566	-0.512	0.647		-0.621	-0.595	0.510
12	Third Mirror Reflected Directions											
13												
14		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
15		x	y	z		x	y	z		x	y	z
16	1	3.900	2.436	2.770		1.700	4.102	1.300				
17	2	4.100	1.879	2.400		3.300	4.400	1.980				
18	3	3.800	0.137	1.800		3.400	3.990	1.500				
19	4	3.150	-0.737	1.800		2.300	2.427	-0.625				
20	5	2.500	-0.159	2.450		1.700	2.524	-0.625				
21	6	2.650	0.757	2.770		1.050	3.101	-0.050				
22	7											
23	8											

FIG. 6A3



	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1											
2											
3											
4	Facet	11									
5	x	y	z								
6	-0.616	0.000	0.788								
7	End			Middle			End				
8	x	y	z	x	y	z	x	y	z		
9	0.333	0.476	0.814	0.415	0.220	0.883	0.433	0.086	0.897		
10	-0.284	0.935	-0.211	-0.382	0.813	-0.440	-0.429	0.728	-0.535		
11	-0.487	-0.316	0.814	-0.594	-0.496	0.633	-0.638	-0.564	0.524		
12											
13											
14	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
15	x	y	z	x	y	z	x	y	z		
16	3.900	2.436	2.770	1.700	4.102	1.300					
17	4.100	1.879	2.400	3.300	4.400	1.980					
18	3.800	0.137	1.800	3.400	3.990	1.500					
19	3.150	-0.737	1.800	2.300	2.427	-0.625					
20	2.500	-0.159	2.450	1.700	2.524	-0.625					
21	2.650	0.757	2.770	1.050	3.101	-0.050					
22											
23											
24											

FIG. 6A4

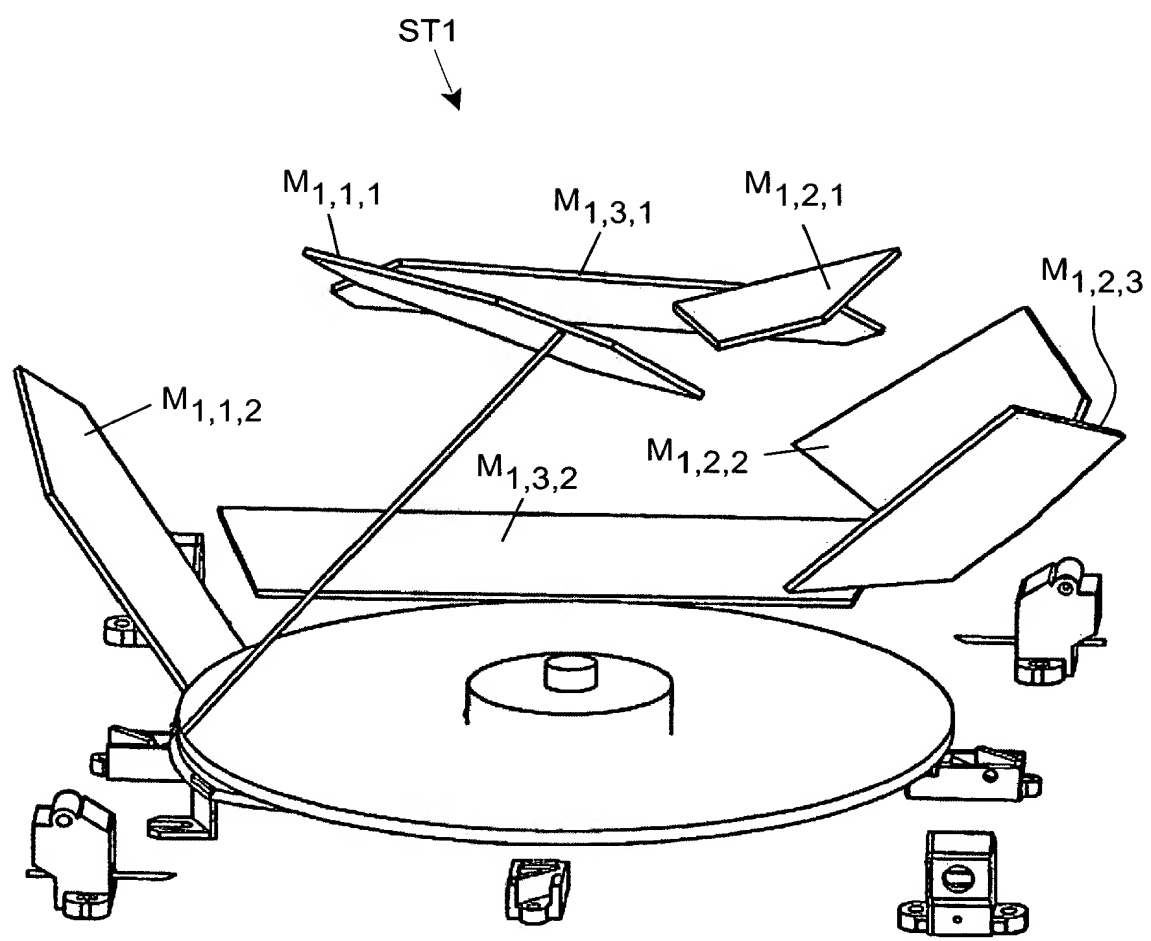
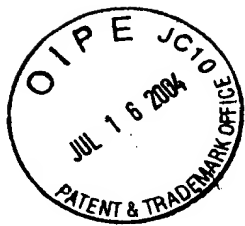


FIG. 6B1



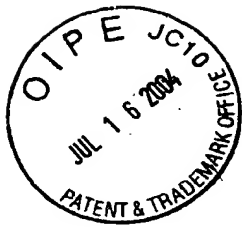
	N	O	P	Q	R	S	T	U	V	W	X
25	Facet	8									
26	x	y	z								
27	-0.616	0.000	0.788								
28	End			Middle			End				
29	x	y	z		x	y	z		x	y	z
30	0.468	-0.249	0.848		0.468	-0.249	0.848		0.430	-0.387	0.816
31	0.408	-0.675	-0.614		0.408	-0.675	-0.614		0.375	-0.774	-0.510
32	-0.999	0.012	-0.034		-0.999	0.012	-0.034		-0.993	-0.106	0.054
33	-0.616	0.531	0.582		-0.616	0.531	0.582		-0.605	0.419	0.677
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											

FIG. 6B2



	A	B	C	D	E	F	G	H	I	J	K	L
25	High Elevation Right Skew	Facet	10									
26	(G1)	x	y	z								
27	Vector from Module	-0.616	0.000	0.788								
28			End				Middle				End	
29		x	y	z		x	y	z		x	y	z
30	Output Vectors From Disk	0.441	-0.235	0.866		0.441	-0.235	0.866		0.398	-0.391	0.830
31	First Mirror Reflected Directions	0.380	-0.673	-0.635		0.380	-0.673	-0.635		0.343	-0.784	-0.517
32	Second Mirror Reflected Directions	-0.998	0.000	-0.067		-0.998	0.000	-0.067		-0.991	-0.133	0.033
33	Third Mirror Reflected Directions	-0.589	0.553	0.589		-0.589	0.553	0.589		-0.578	0.426	0.697
34												
35		Mirror 1 Corners								Mirror 3 Corners		
36		x	y	z		x	y	z		x	y	z
37	1	2.550	-1.630	2.650		4.000	-2.630	0.049		3.746	-3.750	1.000
38	2	4.150	-2.267	2.770		4.900	-1.400	0.775		1.371	-3.300	2.100
39	3	3.950	0.196	2.060		4.600	-3.150	2.118		1.159	-1.600	0.800
40	4	2.420	-0.309	2.270		3.800	-3.900	1.067		2.824	-2.000	0.100
41	5									3.771	-2.700	0.100
42	6											
43	7											
44	8											
45												

FIG. 6B3



	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
25	Facet	12									
26	x	y	z								
27	-0.616	0.000	0.788								
28	End		Middle			End					
29	x	y	z		x	y	z		x	y	z
30	0.415	-0.220	0.883		0.415	-0.220	0.883		0.369	-0.387	0.845
31	0.351	-0.669	-0.655		0.351	-0.669	-0.655		0.312	-0.788	-0.530
32	-0.995	-0.012	-0.099		-0.995	-0.012	-0.099		-0.988	-0.153	0.007
33	-0.562	0.574	0.596		-0.562	0.574	0.596		-0.550	0.439	0.710
34											
35	Mirror 1 Corners		Mirror 2 Corners			Mirror 3 Corners					
36	x	y	z		x	y	z		x	y	z
37	2.550	-1.630	2.650		4.000	-2.630	0.049		3.746	-3.750	1.000
38	4.150	-2.267	2.770		4.900	-1.400	0.775		1.371	-3.300	2.100
39	3.950	0.196	2.060		4.600	-3.150	2.118		1.159	-1.600	0.800
40	2.420	-0.309	2.270		3.800	-3.900	1.067		2.824	-2.000	0.100
41									3.771	-2.700	0.100
42											
43											
44											
45											

FIG. 6B4

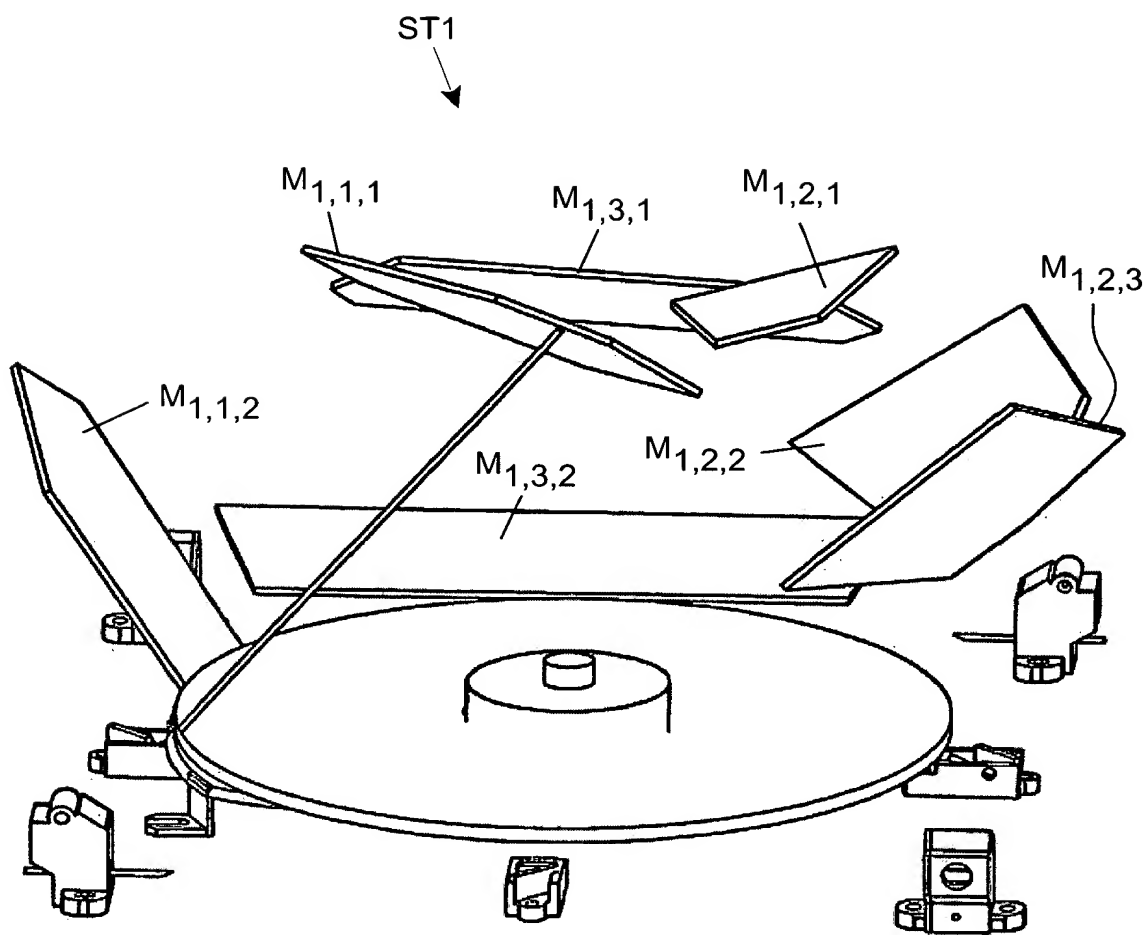
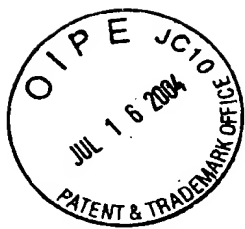
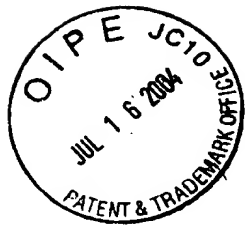
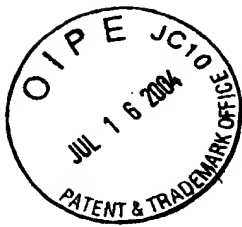


FIG. 6C1



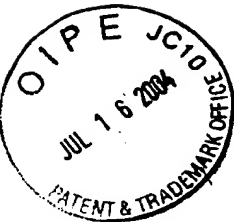
	N	O	P	Q	R	S	T	U	V	W	X
46	Facet	1									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End				Middle				End		
50	x	y	z		x	y	z		x	y	z
51	0.753	0.321	0.575		0.788	0.000	0.616		0.753	-0.321	0.575
52	-0.366	0.443	-0.819		-0.425	0.132	-0.896		-0.421	-0.193	-0.887
53	-0.574	0.468	0.672		-0.653	0.160	0.740		-0.648	-0.165	0.743
54											
55											
56	Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
57	x	y	z		x	y	z		x	y	z
58	4.250	1.500	2.547		3.150	2.450	0.030				
59	4.950	2.000	2.029		4.500	2.800	0.213				
60	5.150	1.800	1.851		4.350	-2.200	0.277				
61	5.000	-1.800	1.656		3.050	-1.850	0.089				
62	4.750	-1.950	1.844								
63	4.100	-1.500	2.405								
64											
65											

FIG. 6C2



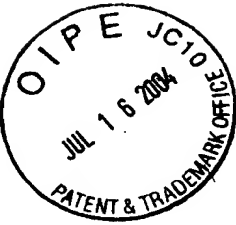
	A	B	C	D	E	F	G	H	I	J	K	L
46	Low Elevation	Facet	2									
47	(G3)	x	y	z								
48	Vector from Module	-0.616	0.000	0.788								
49			End				Middle				End	
50		x	y	z		x	y	z		x	y	z
51	Output Vectors From Disk	0.734	0.305	0.607		0.766	0.000	0.643		0.731	-0.319	0.604
52	First Mirror Reflected Directions	-0.402	0.429	-0.809		-0.456	0.133	-0.880		-0.453	-0.190	-0.871
53	Second Mirror Reflected Directions	-0.607	0.454	0.653		-0.679	0.161	0.716		-0.675	-0.162	0.719
54	Third Mirror Reflected Directions											
55												
56		Mirror 1 Corners								Mirror 3 Corners		
57		x	y	z		x	y	z		x	y	z
58	1	4.250	1.500	2.547		3.150	2.450	0.030				
59	2	4.950	2.000	2.029		4.500	2.800	0.213				
60	3	5.150	1.800	1.951		4.350	-2.200	0.277				
61	4	5.000	-1.800	1.656		3.050	-1.850	0.089				
62	5	4.750	-1.950	1.844								
63	6	4.100	-1.500	2.405								
64	7											
65	8											

FIG. 6C3



	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
46	Facet	3									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End		Middle			End					
50	x	y	z	x	y	z	x	y	z		
51	0.714	0.290	0.638	0.743	0.000	0.669	0.709	-0.311	0.633		
52	-0.438	0.416	-0.797	-0.487	0.134	-0.863	-0.485	-0.181	-0.855		
53	-0.638	0.440	0.632	-0.704	0.161	0.692	-0.702	-0.155	0.695		
54											
55											
56	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
57	x	y	z	x	y	z	x	y	z		
58	4.250	1.500	2.547	3.150	2.450	0.030					
59	4.950	2.000	2.029	4.500	2.800	0.213					
60	5.150	1.800	1.851	4.350	-2.200	0.277					
61	5.000	-1.800	1.656	3.050	-1.850	0.089					
62	4.750	-1.950	1.844								
63	4.100	-1.500	2.405								
64											
65											

FIG. 6C4



	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
46	Facet	4									
47	x	y	z								
48	-0.616	0.000	0.788								
49		End			Middle				End		
50	x	y	z		x	y	z		x	y	z
51	0.692	0.275	0.667		0.719	0.000	0.695		0.686	-0.307	0.660
52	-0.472	0.402	-0.784		-0.517	0.135	-0.846		-0.516	-0.176	-0.838
53	-0.667	0.426	0.611		-0.728	0.161	0.666		-0.727	-0.151	0.670
54											
55											
56	Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
57	x	y	z		x	y	z		x	y	z
58	4.250	1.500	2.547		3.150	2.450	0.030				
59	4.950	2.000	2.029		4.500	2.800	0.213				
60	5.150	1.800	1.851		4.350	-2.200	0.277				
61	5.000	-1.800	1.656		3.050	-1.850	0.089				
62	4.750	-1.950	1.844								
63	4.100	-1.500	2.405								
64											
65											

FIG. 6C5

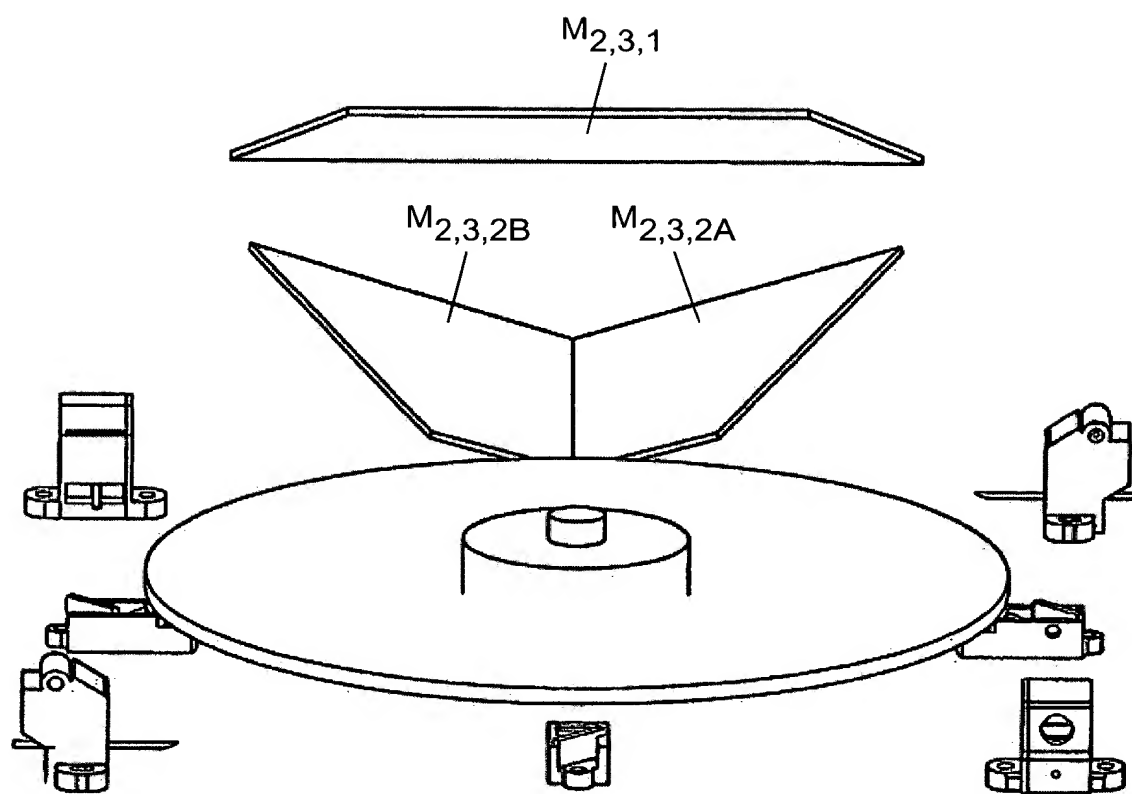
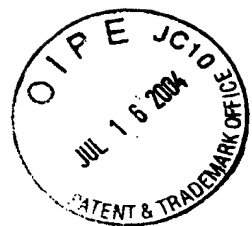
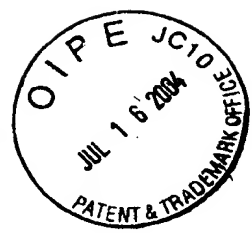


FIG. 6D1



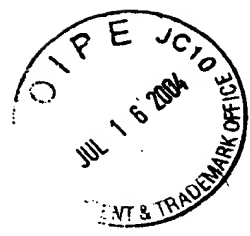
	N	O	P	Q	R	S	T	U	V	W	X
46	Facet	1									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End			Middle			End				
50	x	y	z		x	y	z		x	y	z
51	0.788	0.000	0.616		0.788	0.000	0.616		0.741	-0.367	0.562
52	-0.140	0.000	-0.990		-0.140	0.000	-0.990		-0.117	-0.367	-0.923
53	-0.595	0.448	0.667		-0.595	0.448	0.667		-0.590	0.098	0.801
54											
55											
56	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
57	x	y	z		x	y	z		x	y	z
58	3.750	-1.600	2.509		3.000	0.000	-0.112				
59	5.100	-2.400	1.728		4.800	0.000	0.382				
60	5.100	2.400	1.728		5.071	-2.256	1.066				
61	3.750	1.600	2.509		5.071	-2.256	1.066				
62					3.060	-1.000	0.175				
63											
64											
65											
66											
67											
68											
69											
70											
71					3.000	0.000	-0.112				
72					4.800	0.000	0.382				
73					5.071	2.256	1.066				
74					5.071	2.256	1.066				
75					3.060	1.000	0.175				
76											

FIG. 6D2



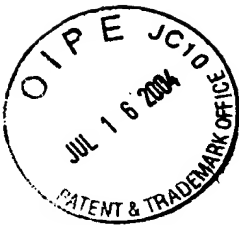
	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
46	Facet	2									
47	x	y	z								
48	-0.616	0.000	0.788								
49		End				Middle				End	
50	x	y	z		x	y	z		x	y	z
51	0.766	0.000	0.643		0.766	0.000	0.643		0.711	-0.395	0.581
52	-0.175	0.000	-0.985		-0.175	0.000	-0.985		-0.149	-0.395	-0.907
53	-0.623	0.440	0.647		-0.623	0.440	0.647		-0.614	0.062	0.787
54											
55											
56											
57											
58											
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											
69											
70											
71											
72											
73											
74											
75											
76											

FIG. 6D3



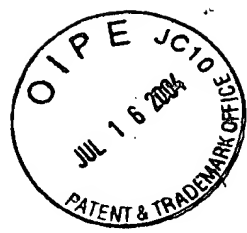
	A	B	C	D	E	F	G	H	I	J	K	L
46	Low Elevation	Facet	3									
47		x	y	z								
48	Vector from Module	-0.616	0.000	0.788								
49		End			Middle			End				
50		x	y	z		x	y	z		x	y	z
51	Output Vectors From Disk	0.743	0.000	0.669		0.743	0.000	0.669		0.697	-0.362	0.619
52	First Mirror Reflected Directions	-0.209	0.000	-0.978		-0.209	0.000	-0.978		-0.189	-0.362	-0.913
53	Second Mirror Reflected Directions	-0.649	0.433	0.625		-0.649	0.433	0.625		-0.648	0.089	0.757
54	Third Mirror Reflected Directions											
55		Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
56		x	y	z		x	y	z		x	y	z
57		1	3.750	-1.600	2.509	3.000	0.000	-0.112				
58		2	5.100	-2.400	1.728	4.800	0.000	0.382				
59		3	5.100	2.400	1.728	5.071	-2.256	1.066				
60		4	3.750	1.600	2.509	5.071	-2.256	1.066				
61		5				3.060	-1.000	0.175				
62		6										
63		7										
64		8										
65												
66												
67												
68												
69	Note: Special Case!											
70												
71	Second Part of Mirror 2											
72						3.000	0.000	-0.112				
73						4.800	0.000	0.382				
74						5.071	2.256	1.066				
75						5.071	2.256	1.066				
76						3.060	1.000	0.175				
77												

FIG. 6D4



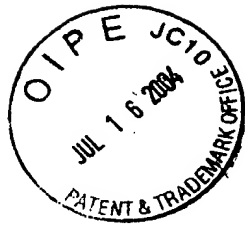
	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
46	Facet	4									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End		Middle						End		
50	x	y	z		x	y	z		x	y	z
51	0.719	0.000	0.695		0.719	0.000	0.695		0.664	-0.395	0.635
52	-0.243	0.000	-0.970		-0.243	0.000	-0.970		-0.220	-0.395	-0.892
53	-0.675	0.425	0.603		-0.675	0.425	0.603		-0.668	0.046	0.742
54											
55											
56	Mirror 1 Corners		Mirror 2 Corners				Mirror 3 Corners				
57	x	y	z		x	y	z		x	y	z
58	3.750	-1.600	2.509		3.000	0.000	-0.112				
59	5.100	-2.400	1.728		4.800	0.000	0.382				
60	5.100	2.400	1.728		5.071	-2.256	1.066				
61	3.750	1.600	2.509		5.071	-2.256	1.066				
62					3.060	-1.000	0.175				
63											
64											
65											
66											
67											
68											
69											
70											
71					3.000	0.000	-0.112				
72					4.800	0.000	0.382				
73					5.071	2.256	1.066				
74					5.071	2.256	1.066				
75					3.060	1.000	0.175				
76											

FIG. 6D5



	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH
46	Facet	5									
47	x	y	z								
48	-0.616	0.000	0.788								
49		End				Middle				End	
50	x	y	z		x	y	z		x	y	z
51	0.669	0.000	0.743		0.669	0.000	0.743		0.634	-0.311	0.708
52	-0.310	0.000	-0.951		-0.310	0.000	-0.951		-0.298	-0.311	-0.903
53	-0.724	0.407	0.557		-0.724	0.407	0.557		-0.730	0.114	0.673
54											
55											
56		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners	
57	x	y	z		x	y	z		x	y	z
58	3.750	-1.600	2.509		3.000	0.000	-0.112				
59	5.100	-2.400	1.728		4.800	0.000	0.382				
60	5.100	2.400	1.728		5.071	-2.256	1.066				
61	3.750	1.600	2.509		5.071	-2.256	1.066				
62					3.060	-1.000	0.175				
63											
64											
65											
66											
67											
68											
69											
70											
71					3.000	0.000	-0.112				
72					4.800	0.000	0.382				
73					5.071	2.256	1.066				
74					5.071	2.256	1.066				
75					3.060	1.000	0.175				
76											

FIG. 6D6



	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX
46	Facet	6													
47	x	y	z												
48	-0.616	0.000	0.788												
49	End			Middle			End								
50	x	y	z		x	y	z		x	y	z				
51	0.616	0.000	0.788		0.616	0.000	0.788		0.596	-0.232	0.769				
52	-0.376	0.000	-0.927		-0.376	0.000	-0.927		-0.369	-0.232	-0.900				
53	-0.770	0.387	0.508		-0.770	0.387	0.508		-0.781	0.173	0.600				
54															
55															
56	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners								
57	x	y	z		x	y	z		x	y	z				
58	3.750	-1.600	2.509		3.000	0.000	-0.112								
59	5.100	-2.400	1.728		4.800	0.000	0.382								
60	5.100	2.400	1.728		5.071	-2.256	1.066								
61	3.750	1.600	2.509		5.071	-2.256	1.066								
62					3.060	-1.000	0.175								
63															
64															
65															
66															
67															
68															
69															
70															
71					3.000	0.000	-0.112								
72					4.800	0.000	0.382								
73					5.071	2.256	1.066								
74					5.071	2.256	1.066								
75					3.060	1.000	0.175								

FIG. 6D7

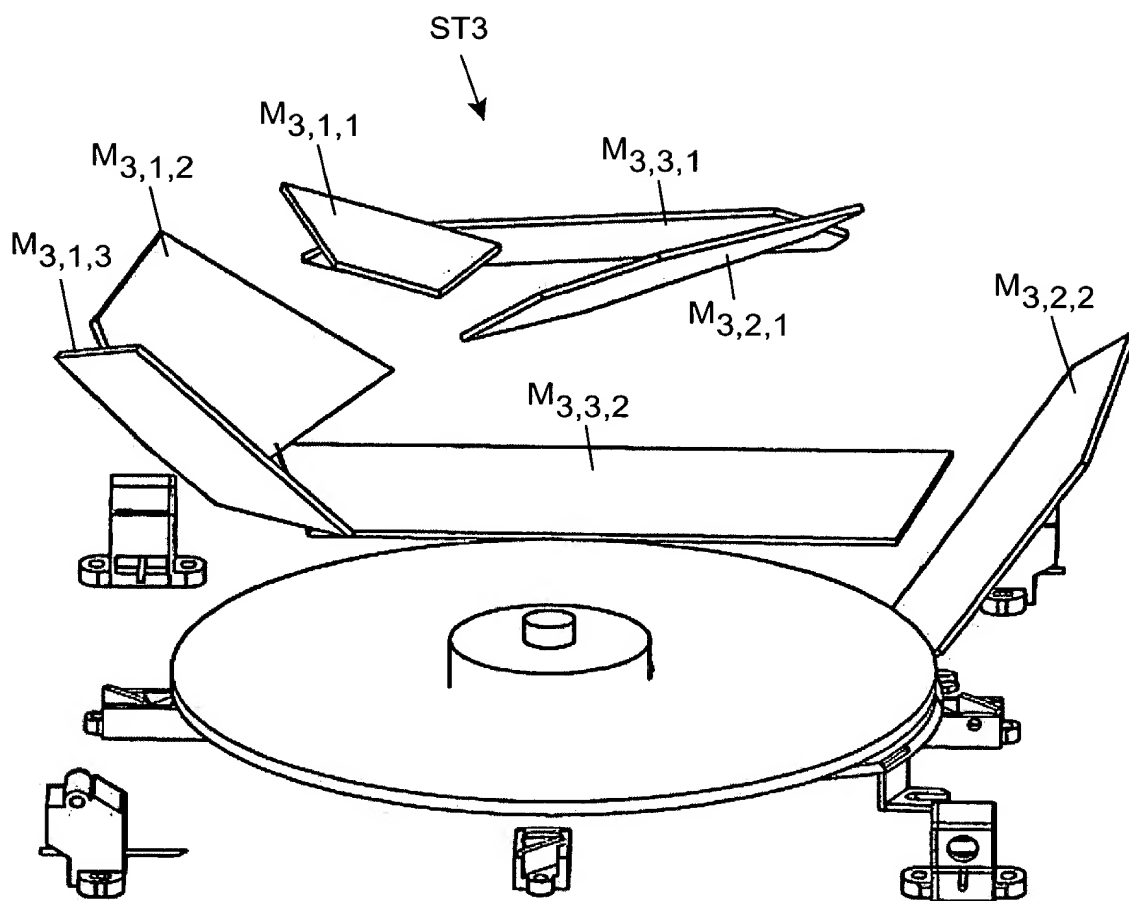
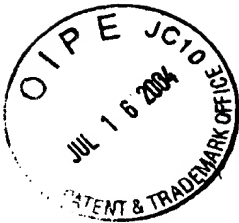
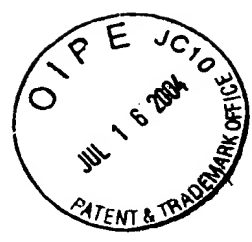


FIG. 6E1



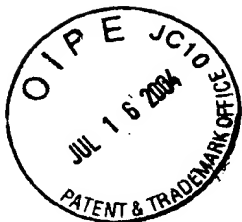
	N	O	P	Q	R	S	T	U	V	W	X
1											
2											
3											
4 Facet	7										
5 x	y	z									
6	-0.616	0.000	0.788								
7	End			Middle			End				
8 x	y	z		x	y	z			x	y	z
9	0.468	0.249	0.848		0.468	0.249	0.848		0.430	0.387	0.816
10	0.408	0.675	-0.614		0.408	0.675	-0.614		0.375	0.774	-0.510
11	-0.999	-0.012	-0.034		-0.999	-0.012	-0.034		-0.993	0.106	0.054
12	-0.616	-0.531	0.582		-0.616	-0.531	0.582		-0.605	-0.419	0.677
13											
14	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
15 x	y	z		x	y	z			x	y	z
16	2.550	1.630	2.650		4.000	2.630	0.049		3.746	3.750	1.000
17	4.150	2.267	2.770		4.900	1.400	0.775		1.371	3.300	2.100
18	3.950	-0.196	2.060		4.600	3.150	2.118		1.159	1.600	0.800
19	2.420	0.309	2.270		3.800	3.900	1.067		2.824	2.000	0.100
20									3.771	2.700	0.100
21											
22											
23											
24											

FIG. 6E2



	A	B	C	D	E	F	G	H	I	J	K	L
1	Station 3											
2												
3												
4	High Elevation Left Skew	Facet	9									
5	(G2)	x	y	z								
6	Vector from Module	-0.616	0.000	0.788								
7		End			Middle			End				
8		x	y	z		x	y	z		x	y	z
9	Output Vectors From Disk	0.441	0.235	0.866		0.441	0.235	0.866		0.398	0.391	0.830
10	First Mirror Reflected Directions	0.380	0.673	-0.635		0.380	0.673	-0.635		0.343	0.784	-0.517
11	Second Mirror Reflected Directions	-0.998	0.000	-0.067		-0.998	0.000	-0.067		-0.991	0.133	0.033
12	Third Mirror Reflected Directions	-0.589	-0.553	0.589		-0.589	-0.553	0.589		-0.578	-0.426	0.697
13												
14		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
15		x	y	z		x	y	z		x	y	z
16	1	2.550	1.630	2.650		4.000	2.630	0.049		3.746	3.750	1.000
17	2	4.150	2.267	2.770		4.900	1.400	0.775		1.371	3.300	2.100
18	3	3.950	-0.196	2.060		4.600	3.150	2.118		1.159	1.600	0.800
19	4	2.420	0.309	2.270		3.800	3.900	1.067		2.824	2.000	0.100
20	5									3.771	2.700	0.100
21	6											
22	7											
23	8											

FIG. 6E3



	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1											
2											
3											
4	Facet	11									
5	x	y	z								
6	-0.616	0.000	0.788								
7	End		Middle			End					
8	x	y	z		x	y	z		x	y	z
9	0.415	0.220	0.883		0.415	0.220	0.883		0.369	0.387	0.845
10	0.351	0.669	-0.655		0.351	0.669	-0.655		0.312	0.788	-0.530
11	-0.995	0.012	-0.099		-0.995	0.012	-0.099		-0.988	0.153	0.007
12	-0.562	-0.574	0.596		-0.562	-0.574	0.596		-0.550	-0.439	0.710
13											
14	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
15	x	y	z		x	y	z		x	y	z
16	2.550	1.630	2.650		4.000	2.630	0.049		3.746	3.750	1.000
17	4.150	2.267	2.770		4.900	1.400	0.775		1.371	3.300	2.100
18	3.950	-0.196	2.060		4.600	3.150	2.118		1.159	1.600	0.800
19	2.420	0.309	2.270		3.800	3.900	1.067		2.824	2.000	0.100
20									3.771	2.700	0.100
21											
22											
23											
24											

FIG. 6E4

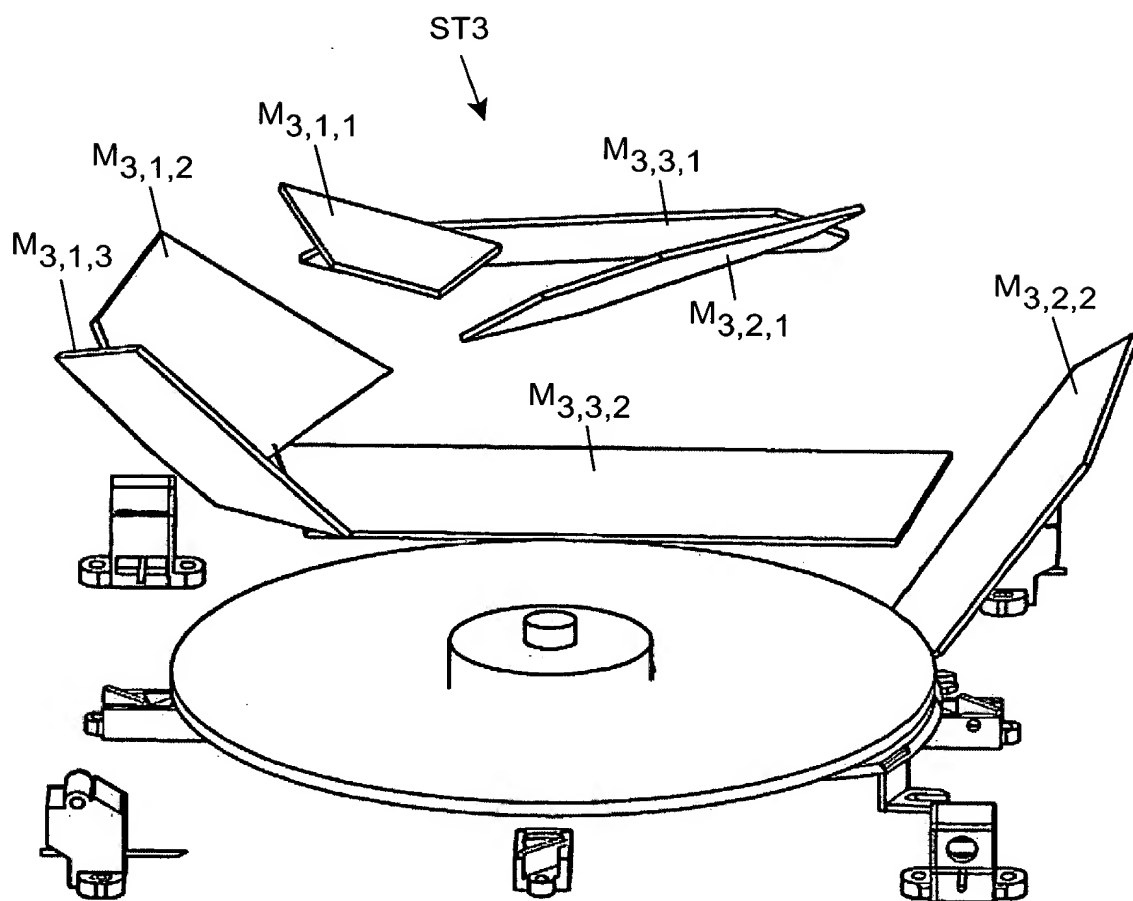
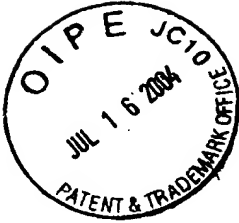


FIG. 6F1



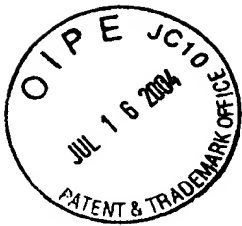
	N	O	P	Q	R	S	T	U	V	W	X
25	Facet	8									
26	x	y	z								
27	-0.616	0.000	0.788								
28		End				Middle				End	
29	x	y	z		x	y	z		x	y	z
30	0.419	-0.416	0.807		0.468	-0.249	0.848		0.494	-0.048	0.868
31	-0.253	-0.917	-0.310		-0.316	-0.832	-0.455		-0.387	-0.704	-0.596
32	-0.469	0.414	0.781		-0.537	0.527	0.659		-0.603	0.626	0.494
33											
34											
35		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners	
36	x	y	z		x	y	z		x	y	z
37	3.900	-2.436	2.770		1.700	-4.102	1.300				
38	4.100	-1.879	2.400		3.300	-4.400	1.980				
39	3.800	-0.137	1.800		3.400	-3.990	1.500				
40	3.150	0.737	1.800		2.300	-2.427	-0.625				
41	2.500	0.159	2.450		1.700	-2.524	-0.625				
42	2.650	-0.757	2.770		1.050	-3.101	-0.050				
43											
44											

FIG. 6F2



	A	B	C	D	E	F	G	H	I	J	K	L
25	High Elevation Right Skew	Facet	10									
26	(G1)	x	y	z								
27	Vector from Module	-0.616	0.000	0.788								
28			End				Middle				End	
29		x	y	z		x	y	z		x	y	z
30	Output Vectors From Disk	0.378	-0.445	0.812		0.441	-0.235	0.866		0.464	-0.068	0.883
31	First Mirror Reflected Directions	-0.269	-0.927	-0.263		-0.349	-0.823	-0.448		-0.408	-0.717	-0.565
32	Second Mirror Reflected Directions	-0.479	0.367	0.797		-0.566	0.512	0.647		-0.621	0.595	0.510
33	Third Mirror Reflected Directions											
34												
35		Mirror 1 Corners					Mirror 2 Corners			Mirror 3 Corners		
36		x	y	z		x	y	z		x	y	z
37	1	3.900	-2.436	2.770		1.700	-4.102	1.300				
38	2	4.100	-1.879	2.400		3.300	-4.400	1.980				
39	3	3.800	-0.137	1.800		3.400	-3.990	1.500				
40	4	3.150	0.737	1.800		2.300	-2.427	-0.625				
41	5	2.500	0.159	2.450		1.700	-2.524	-0.625				
42	6	2.650	-0.757	2.770		1.050	-3.101	-0.050				
43	7											
44	8											

FIG. 6F3



	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
25	Facet	12									
26	x	y	z								
27	-0.616	0.000	0.788								
28		End				Middle				End	
29	x	y	z	x	y	z	x	y	z		
30	0.333	-0.476	0.814	0.415	-0.220	0.883	0.433	-0.086	0.897		
31	-0.284	-0.935	-0.211	-0.382	-0.813	-0.440	-0.429	-0.728	-0.535		
32	-0.487	0.316	0.814	-0.594	0.496	0.633	-0.638	0.564	0.524		
33											
34											
35		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners	
36	x	y	z	x	y	z	x	y	z		
37	3.900	-2.436	2.770	1.700	-4.102	1.300					
38	4.100	-1.879	2.400	3.300	-4.400	1.980					
39	3.800	-0.137	1.800	3.400	-3.990	1.500					
40	3.150	0.737	1.800	2.300	-2.427	-0.625					
41	2.500	0.159	2.450	1.700	-2.524	-0.625					
42	2.650	-0.757	2.770	1.050	-3.101	-0.050					
43											
44											
45											

FIG. 6F4

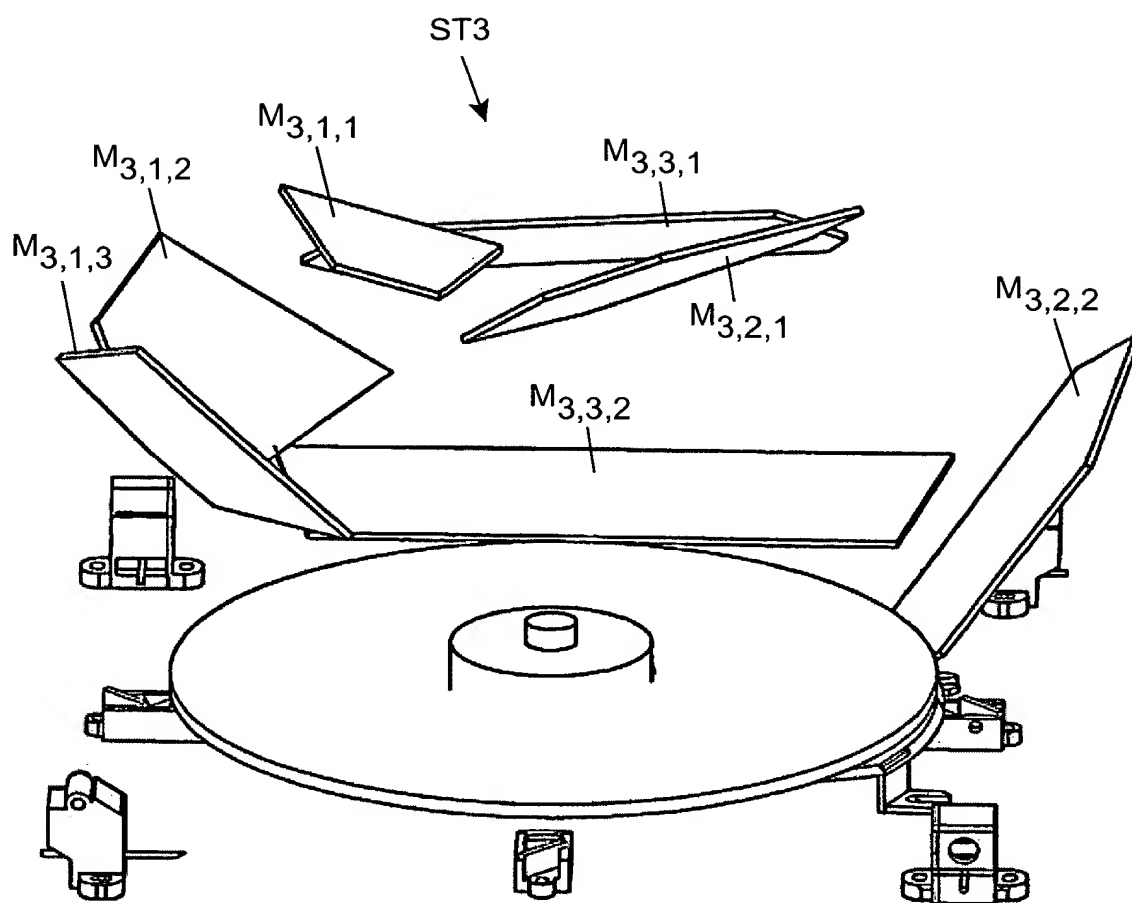
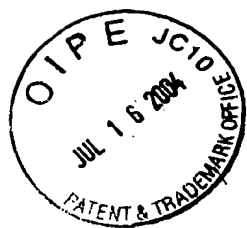
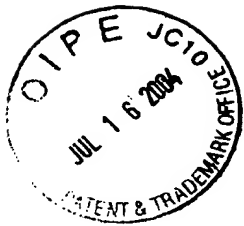


FIG. 6G1



	N	O	P	Q	R	S	T	U	V	W	X
46	Facet	1									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End				Middle				End		
50	x	y	z		x	y	z		x	y	z
51	0.753	-0.321	0.575		0.788	0.000	0.616		0.753	0.321	0.575
52	-0.366	-0.443	-0.819		-0.425	-0.132	-0.896		-0.421	0.193	-0.887
53	-0.574	-0.468	0.672		-0.653	-0.160	0.740		-0.648	0.165	0.743
54											
55											
56	Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
57	x	y	z		x	y	z		x	y	z
58	4.250	-1.500	2.547		3.150	-2.450	0.030				
59	4.950	-2.000	2.029		4.500	-2.800	0.213				
60	5.150	-1.800	1.851		4.350	2.200	0.277				
61	5.000	1.800	1.656		3.050	1.850	0.089				
62	4.750	1.950	1.844								
63	4.100	1.500	2.405								
64											
65											

FIG. 6G2

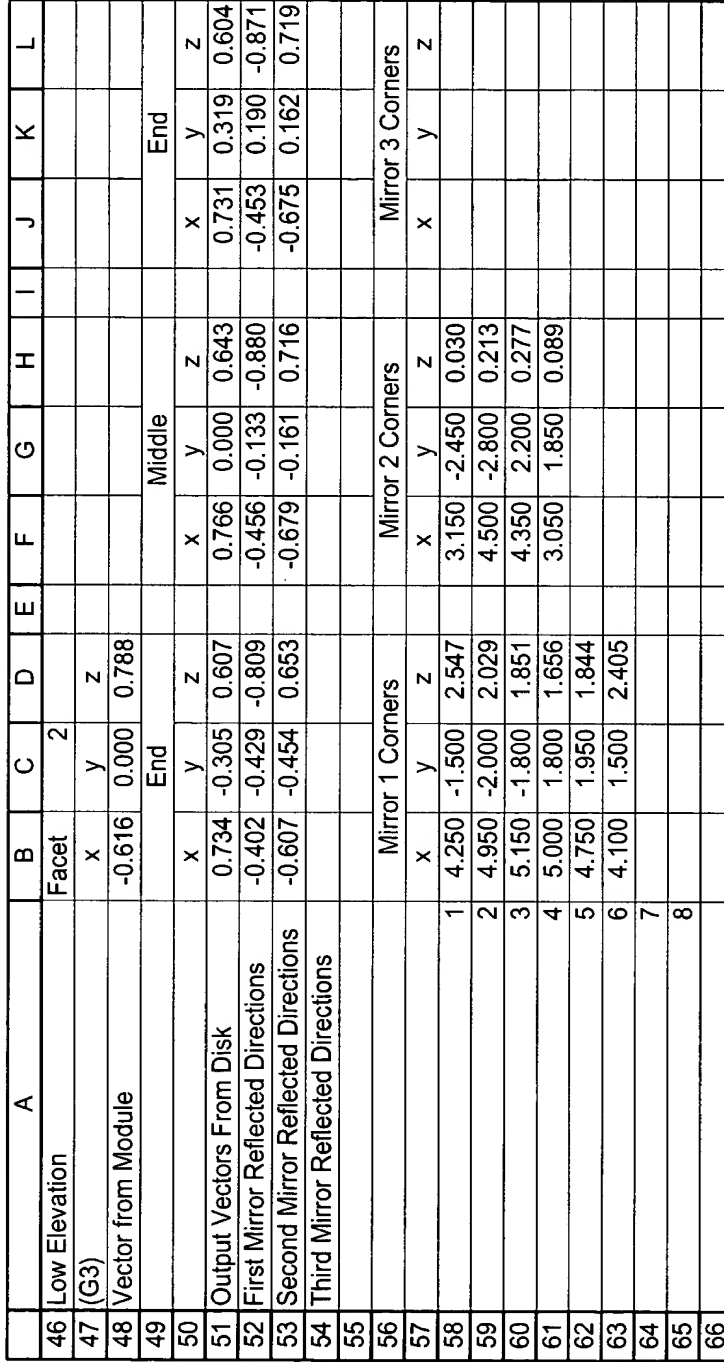
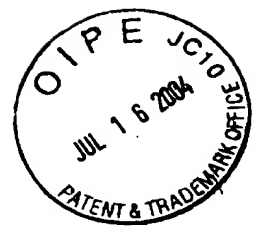


FIG. 6G3



	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
46	Facet	3									
47	x	y	z								
48	-0.616	0.000	0.788								
49		End				Middle				End	
50	x	y	z		x	y	z		x	y	z
51	0.714	-0.290	0.638		0.743	0.000	0.669		0.709	0.311	0.633
52	-0.438	-0.416	-0.797		-0.487	-0.134	-0.863		-0.485	0.181	-0.855
53	-0.638	-0.440	0.632		-0.704	-0.161	0.692		-0.702	0.155	0.695
54											
55											
56		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners	
57	x	y	z		x	y	z		x	y	z
58	4.250	-1.500	2.547		3.150	-2.450	0.030				
59	4.950	-2.000	2.029		4.500	-2.800	0.213				
60	5.150	-1.800	1.851		4.350	2.200	0.277				
61	5.000	1.800	1.656		3.050	1.850	0.089				
62	4.750	1.950	1.844								
63	4.100	1.500	2.405								
64											
65											

FIG. 6G4



	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
46	Facet	4									
47	x	y	z								
48	-0.616	0.000	0.788								
49		End				Middle				End	
50	x	y	z		x	y	z		x	y	z
51	0.692	-0.275	0.667		0.719	0.000	0.695		0.686	0.307	0.660
52	-0.472	-0.402	-0.784		-0.517	-0.135	-0.846		-0.516	0.176	-0.838
53	-0.667	-0.426	0.611		-0.728	-0.161	0.666		-0.727	0.151	0.670
54											
55											
56		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners	
57	x	y	z		x	y	z		x	y	z
58	4.250	-1.500	2.547		3.150	-2.450	0.030				
59	4.950	-2.000	2.029		4.500	-2.800	0.213				
60	5.150	-1.800	1.851		4.350	2.200	0.277				
61	5.000	1.800	1.656		3.050	1.850	0.089				
62	4.750	1.950	1.844								
63	4.100	1.500	2.405								
64											
65											

FIG. 6G5

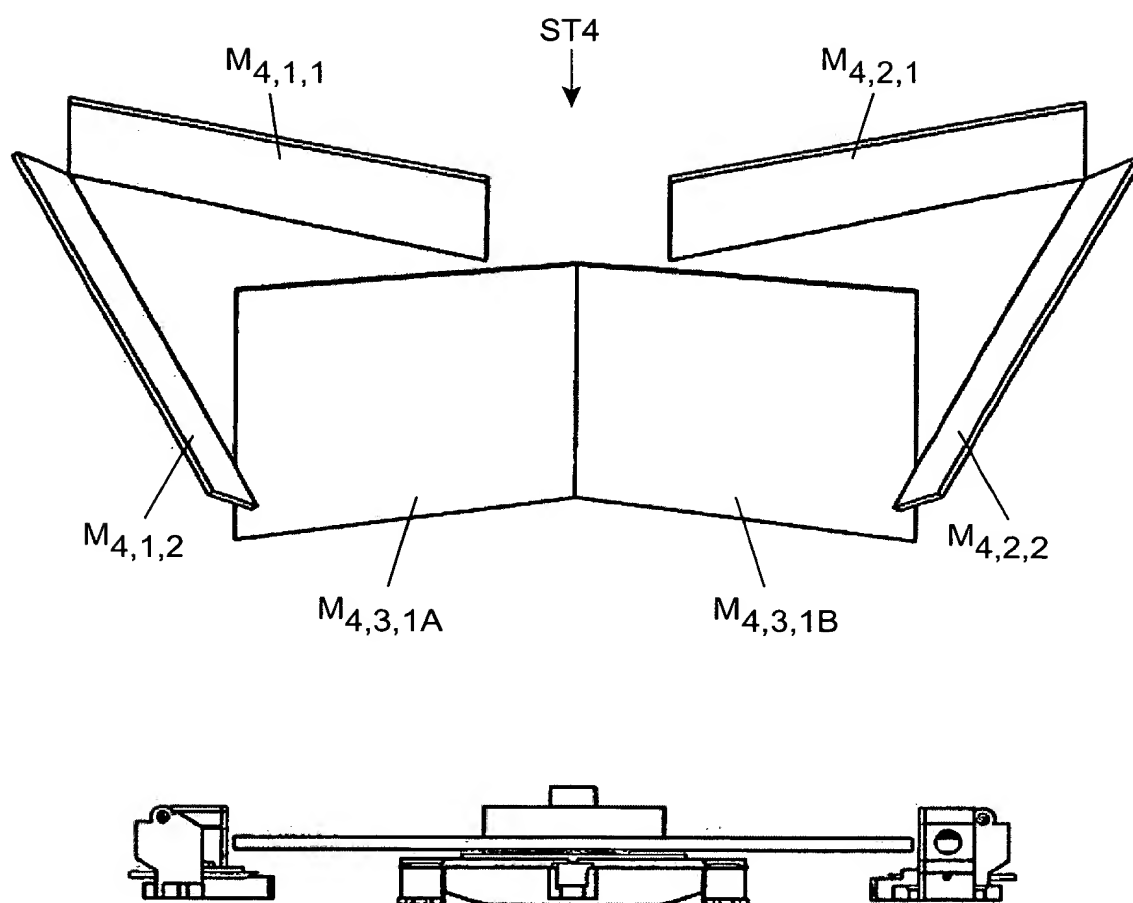
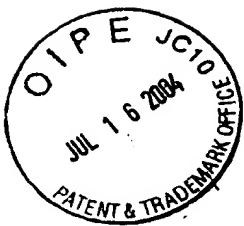
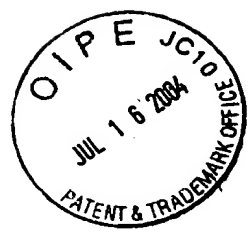
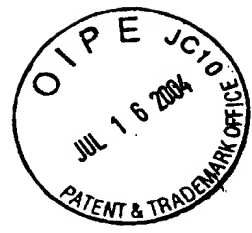


FIG. 6H1



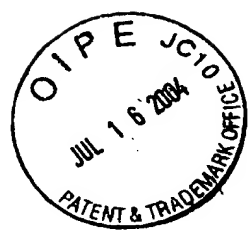
	N	O	P	Q	R	S	T	U	V	W	X
1											
2											
3											
4	Facet	7									
5	x	y	z								
6	-0.616	0.000	0.788								
7	End			Middle			End				
8	x	y	z		x	y	z		x	y	z
9	0.399	0.468	0.789		0.468	0.249	0.848		0.481	0.180	0.858
10	-0.433	0.736	-0.519		-0.495	0.559	-0.665		-0.511	0.500	-0.700
11	-0.737	-0.585	0.339		-0.768	-0.631	0.108		-0.771	-0.636	0.038
12											
13											
14	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
15	x	y	z		x	y	z		x	y	z
16	4.900	0.800	6.409		2.850	3.200	3.370				
17	6.100	0.800	5.645		4.200	2.800	3.231				
18	6.000	4.500	6.468		5.950	4.500	6.464				
19	4.900	4.500	7.168		4.600	4.950	6.680				
20											
21											
22											
23											

FIG. 6H2



	A	B	C	D	E	F	G	H	I	J	K	L
1	Station 4											
2												
3												
4	High Elevation Left Skew	Facet	9									
5		x	y	z								
6	Vector from Module	-0.616	0.000	0.788								
7		End				Middle				End		
8		x	y	z		x	y	z		x	y	z
9	Output Vectors From Disk	0.366	0.474	0.801		0.441	0.235	0.866		0.452	0.177	0.874
10	First Mirror Reflected Directions	-0.458	0.739	-0.494		-0.525	0.546	-0.653		-0.538	0.496	-0.681
11	Second Mirror Reflected Directions	-0.755	-0.556	0.348		-0.789	-0.606	0.096		-0.792	-0.610	0.037
12	Third Mirror Reflected Directions											
13		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
14		x	y	z		x	y	z		x	y	z
15		1	4.900	0.800	6.409		2.850	3.200	3.370			
16		2	6.100	0.800	5.645		4.200	2.800	3.231			
17		3	6.000	4.500	6.468		5.950	4.500	6.464			
18		4	4.900	4.500	7.168		4.600	4.950	6.680			
19		5										
20		6										
21		7										
22												

FIG. 6H3



	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1											
2											
3											
4	Facet	11									
5	x	y	z								
6	-0.616	0.000	0.788								
7	End		Middle				End				
8	x	y	z		x	y	z		x	y	z
9	0.332	0.478	0.813		0.415	0.220	0.883		0.422	0.176	0.889
10	-0.482	0.741	-0.467		-0.554	0.533	-0.640		-0.564	0.494	-0.661
11	-0.773	-0.526	0.356		-0.810	-0.581	0.084		-0.811	-0.583	0.039
12											
13											
14	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
15	x	y	z		x	y	z		x	y	z
16	4.900	0.800	6.409		2.850	3.200	3.370				
17	6.100	0.800	5.645		4.200	2.800	3.231				
18	6.000	4.500	6.468		5.950	4.500	6.464				
19	4.900	4.500	7.168		4.600	4.950	6.680				
20											
21											
22											
23											
24											

FIG. 6H4

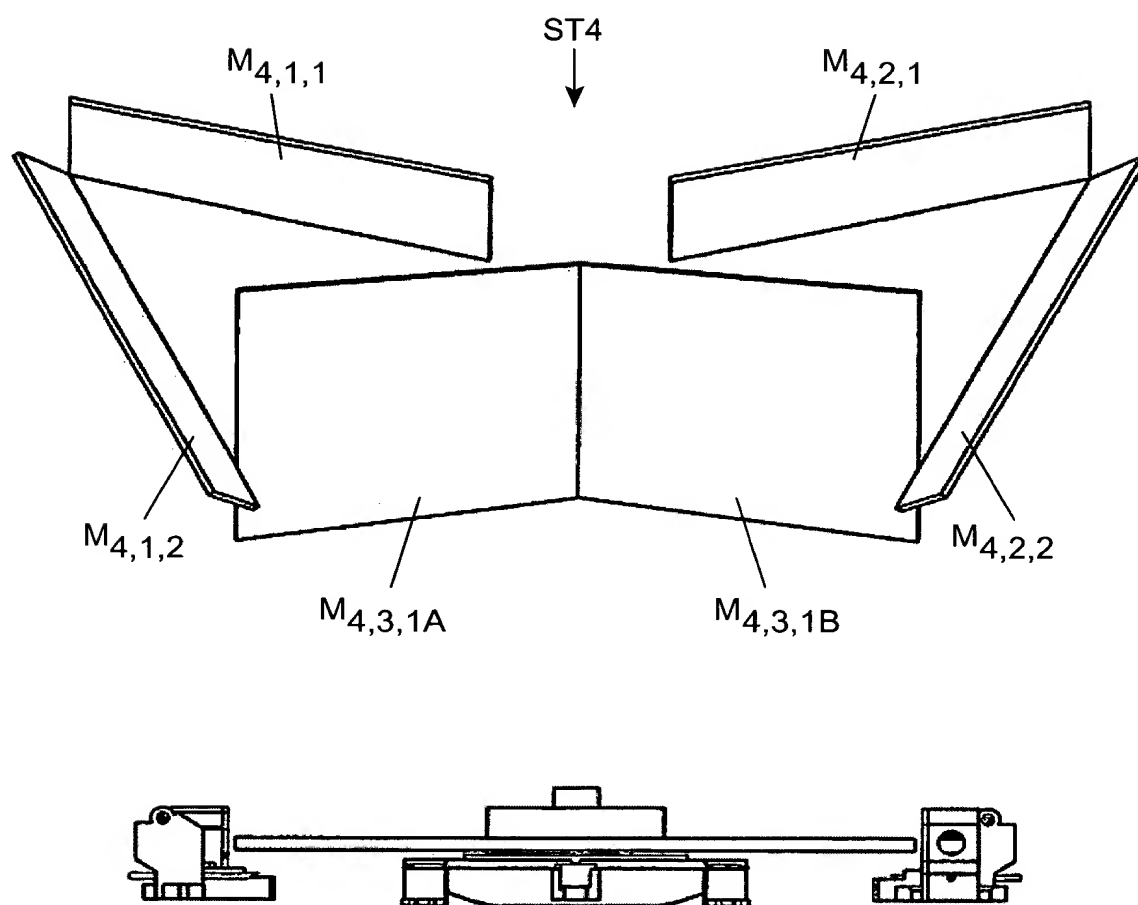
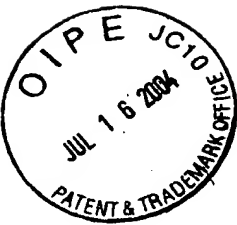


FIG. 611



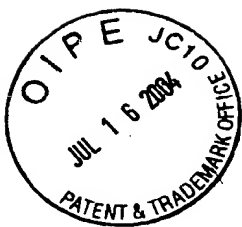
	N	O	P	Q	R	S	T	U	V	W	X
25	Facet	8									
26	x	y	z								
27	-0.616	0.000	0.788								
28	End			Middle			End				
29	x	y	z		x	y	z		x	y	z
30	0.481	-0.180	0.858		0.468	-0.249	0.848		0.399	-0.468	0.789
31	-0.511	-0.500	-0.700		-0.495	-0.559	-0.665		-0.433	-0.736	-0.519
32	-0.771	0.636	0.038		-0.768	0.631	0.108		-0.737	0.585	0.339
33											
34											
35	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
36	x	y	z		x	y	z		x	y	z
37	4.900	-0.800	6.409		2.850	-3.200	3.370				
38	6.100	-0.800	5.645		4.200	-2.800	3.231				
39	6.000	-4.500	6.468		5.950	-4.500	6.464				
40	4.900	-4.500	7.168		4.600	-4.950	6.680				
41											
42											
43											

FIG. 6I2



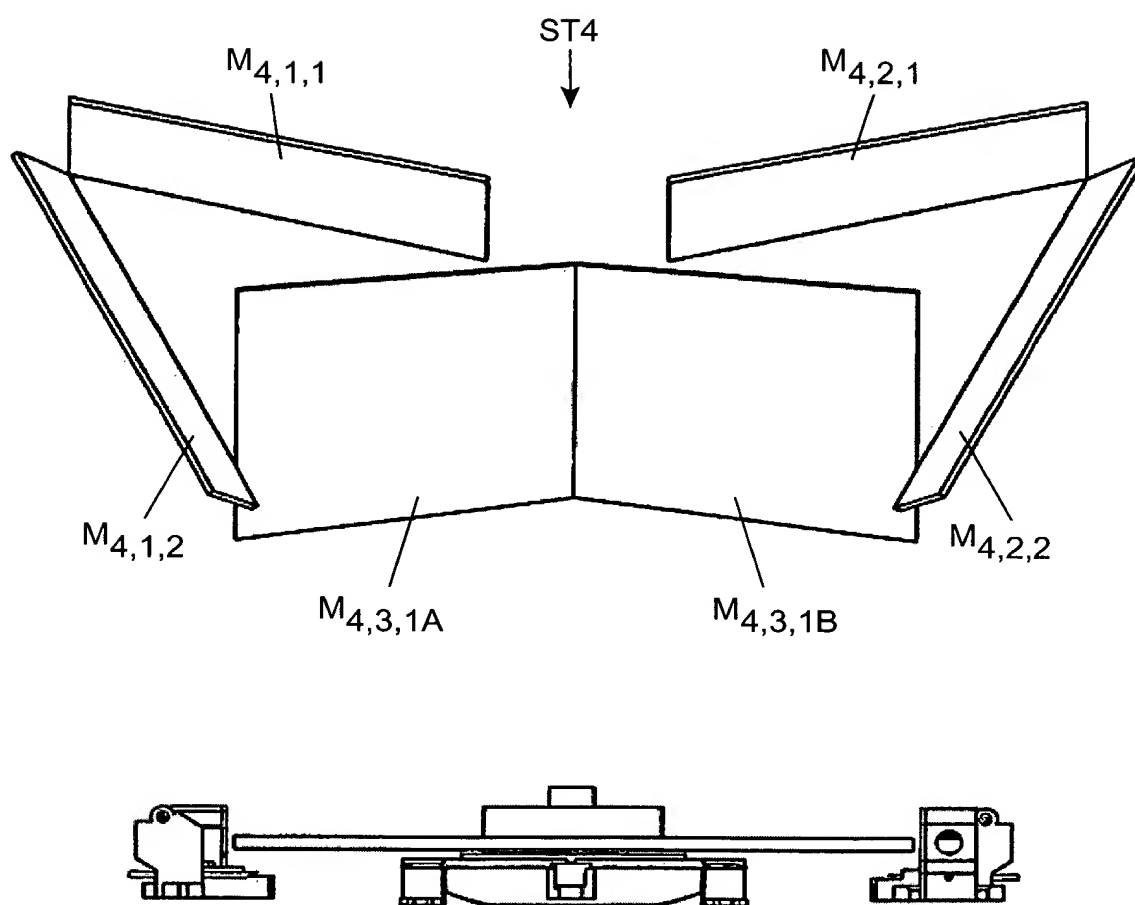
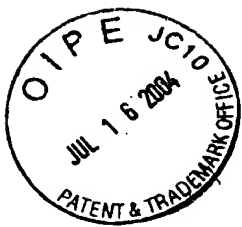
	A	B	C	D	E	F	G	H	I	J	K	L
25	High Elevation Right Skew	Facet	10									
26		x	y	z								
27	Vector from Module	-0.616	0.000	0.788								
28		End			Middle			End				
29		x	y	z		x	y	z		x	y	z
30	Output Vectors From Disk	0.452	-0.177	0.874		0.441	-0.235	0.866		0.366	-0.474	0.801
31	First Mirror Reflected Directions	-0.538	-0.496	-0.681		-0.525	-0.546	-0.653		-0.458	-0.739	-0.494
32	Second Mirror Reflected Directions	-0.792	0.610	0.037		-0.789	0.606	0.096		-0.755	0.556	0.348
33	Third Mirror Reflected Directions											
34												
35		Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
36		x	y	z		x	y	z		x	y	z
37	1	4.900	-0.800	6.409		2.850	-3.200	3.370				
38	2	6.100	-0.800	5.645		4.200	-2.800	3.231				
39	3	6.000	-4.500	6.468		5.950	-4.500	6.464				
40	4	4.900	-4.500	7.168		4.600	-4.950	6.680				
41	5											
42	6											
43	7											
44	8											

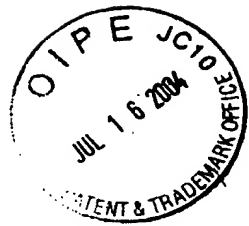
FIG. 6I3



	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
25	Facet	12									
26	x	y	z								
27	-0.616	0.000	0.788								
28		End				Middle				End	
29	x	y	z		x	y	z		x	y	z
30	0.422	-0.176	0.889		0.415	-0.220	0.883		0.332	-0.478	0.813
31	-0.564	-0.494	-0.661		-0.554	-0.533	-0.640		-0.482	-0.741	-0.467
32	-0.811	0.583	0.039		-0.810	0.581	0.084		-0.773	0.526	0.356
33											
34											
35		Mirror 1 Corners									
36	x	y	z		x	y	z		x	y	z
37	4.900	-0.800	6.409		2.850	-3.200	3.370				
38	6.100	-0.800	5.645		4.200	-2.800	3.231				
39	6.000	-4.500	6.468		5.950	-4.500	6.464				
40	4.900	-4.500	7.168		4.600	-4.950	6.680				
41											
42											
43											
44											

FIG. 6I4





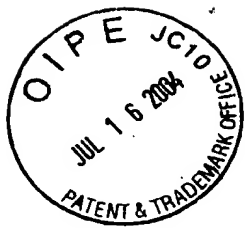
	N	O	P	Q	R	S	T	U	V	W	X
46	Facet	1									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End			Middle			End				
50	x	y	z		x	y	z		x	y	z
51	0.788	0.001	0.616		0.788	0.000	0.616		0.741	-0.367	0.562
52	-0.938	0.335	0.087		-0.939	0.334	0.087		-0.999	-0.031	0.029
53											
54											
55											
56	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
57	x	y	z		x	y	z		x	y	z
58	6.700	0.000	5.608								
59	7.400	0.000	3.322								
60	6.950	-3.000	2.897								
61	6.200	-3.000	5.345								
62											
63											
64											
65											
66											

FIG. 6J2



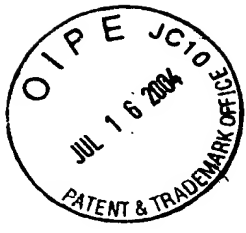
	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
46	Facet	2									
47	x	y	z								
48	-0.616	0.000	0.788								
49		End			Middle					End	
50	x	y	z		x	y	z		x	y	z
51	0.766	0.000	0.643		0.766	0.000	0.643		0.711	-0.395	0.581
52	-0.936	0.329	0.121		-0.936	0.329	0.121		-0.996	-0.065	0.058
53											
54											
55											
56		Mirror 1 Corners			Mirror 2 Corners				Mirror 3 Corners		
57	x	y	z		x	y	z		x	y	z
58	6.700	0.000	5.608								
59	7.400	0.000	3.322								
60	6.950	-3.000	2.897								
61	6.200	-3.000	5.345								
62											
63											
64											
65											
66											

FIG. 6J3



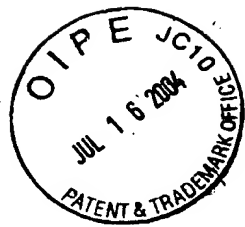
	A	B	C	D	E	F	G	H	I	J	K	L
46	Low Elevation	Facet	3									
47		x	y	z								
48	Vector from Module	-0.616	0.000	0.788								
49			End				Middle				End	
50		x	y	z		x	y	z		x	y	z
51	Output Vectors From Disk	0.743	0.000	0.669		0.743	0.000	0.669		0.697	-0.362	0.619
52	First Mirror Reflected Directions	-0.933	0.324	0.156		-0.933	0.324	0.156		-0.994	-0.035	0.101
53	Second Mirror Reflected Directions											
54	Third Mirror Reflected Directions											
55												
56		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
57		x	y	z		x	y	z		x	y	z
58	1	6.700	0.000	5.608								
59	2	7.400	0.000	3.322								
60	3	6.950	-3.000	2.897								
61	4	6.200	-3.000	5.345								
62	5											
63	6											
64	7											
65	8											
66												

FIG. 6J4



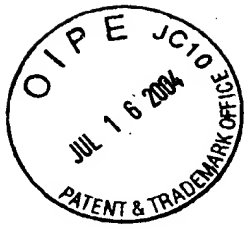
	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
46	Facet	4									
47	x	y	z								
48	-0.616	0.000	0.788								
49		End				Middle				End	
50	x	y	z		x	y	z		x	y	z
51	0.719	0.000	0.695		0.719	0.000	0.695		0.664	-0.395	0.635
52	-0.929	0.319	0.190		-0.929	0.319	0.190		-0.989	-0.075	0.129
53											
54											
55											
56		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners	
57	x	y	z		x	y	z		x	y	z
58	6.700	0.000	5.608								
59	7.400	0.000	3.322								
60	6.950	-3.000	2.897								
61	6.200	-3.000	5.345								
62											
63											
64											
65											
66											

FIG. 6J5



	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH
46	Facet	5									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End			Middle				End			
50	x	y	z		x	y	z		x	y	z
51	0.669	0.000	0.743		0.669	0.000	0.743		0.621	-0.362	0.695
52	-0.916	0.307	0.257		-0.916	0.307	0.257		-0.977	-0.052	0.206
53											
54											
55											
56	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners				
57	x	y	z		x	y	z		x	y	z
58	6.700	0.000	5.608								
59	7.400	0.000	3.322								
60	6.950	-3.000	2.897								
61	6.200	-3.000	5.345								
62											
63											
64											
65											

FIG. 6J6



	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU
46	Facet	6										
47	x	y	z									
48	-0.616	0.000	0.788									
49	End			Middle			End					
50	x	y	z		x	y	z		x	y	z	
51	0.616	0.000	0.788		0.616	0.000	0.788		0.561	-0.380	0.735	
52	-0.900	0.293	0.324		-0.900	0.293	0.324		-0.959	-0.086	0.270	
53												
54												
55												
56	Mirror 1 Corners			Mirror 2 Corners			Mirror 3 Corners					
57	x	y	z		x	y	z		x	y	z	
58	6.700	0.000	5.608									
59	7.400	0.000	3.322									
60	6.950	-3.000	2.897									
61	6.200	-3.000	5.345									
62												
63												
64												
65												

FIG. 6J7

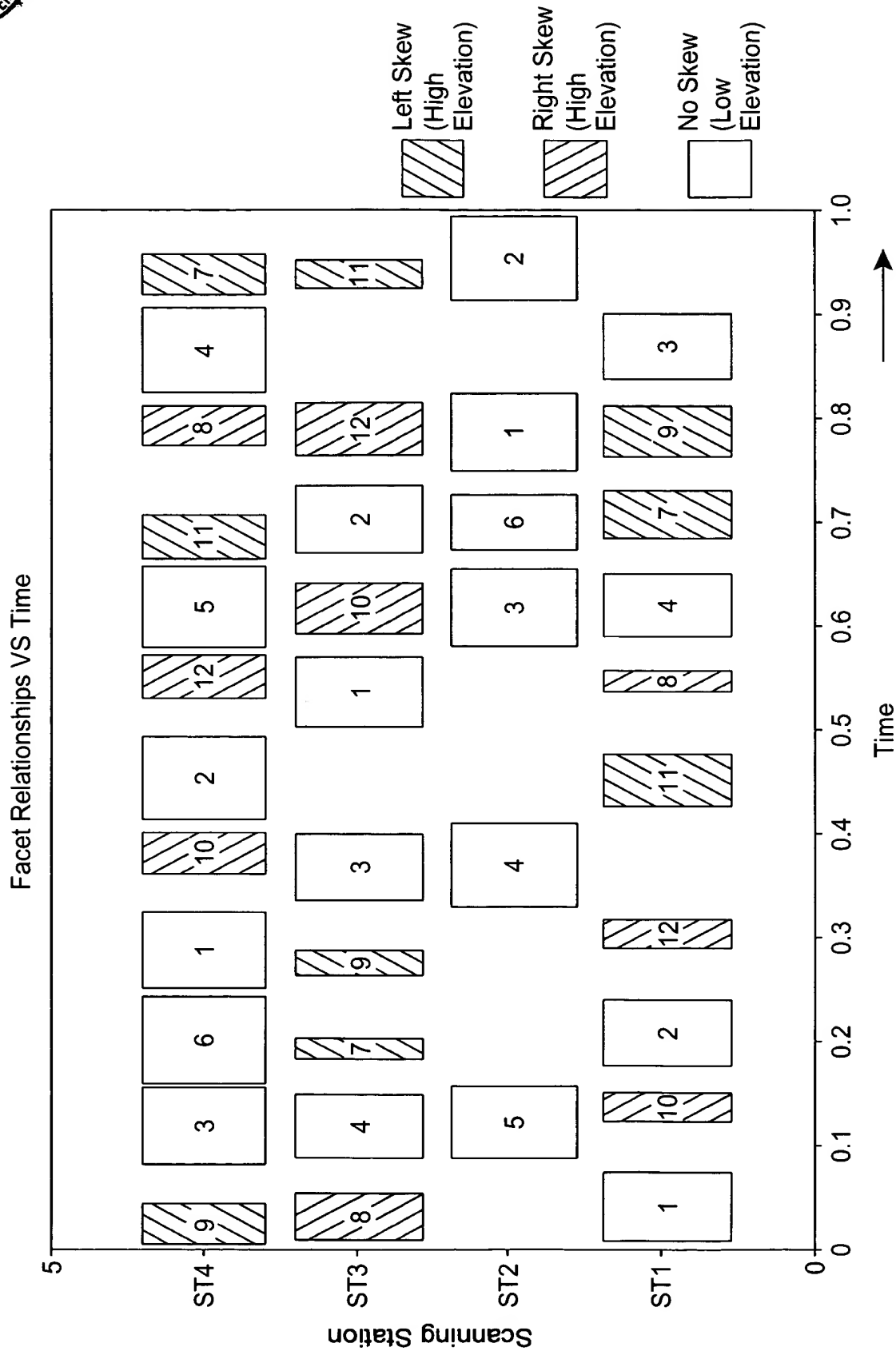
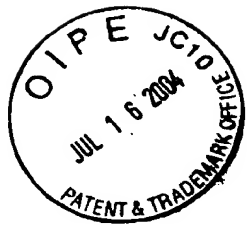


FIG. 6K

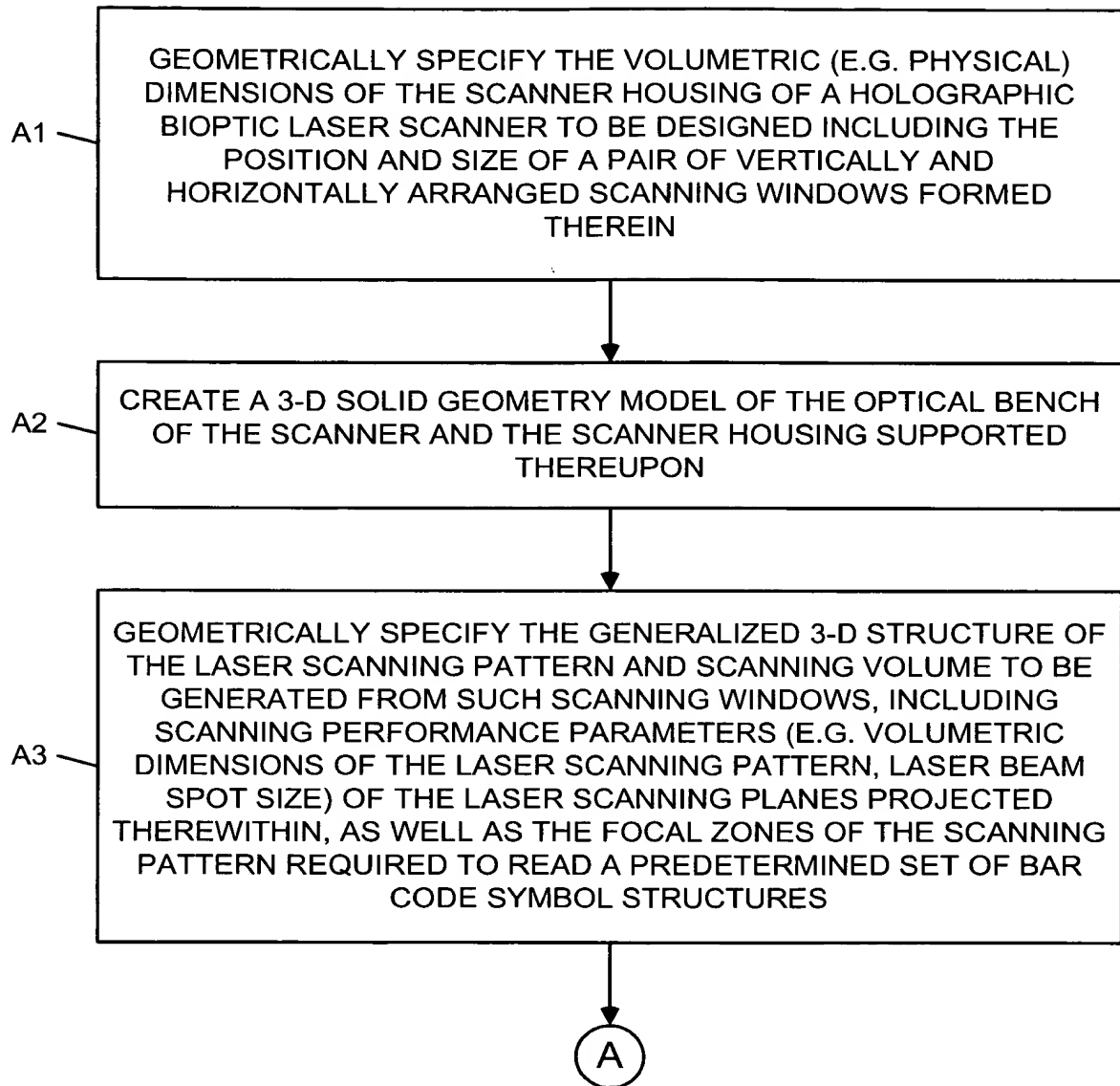


FIG. 7A

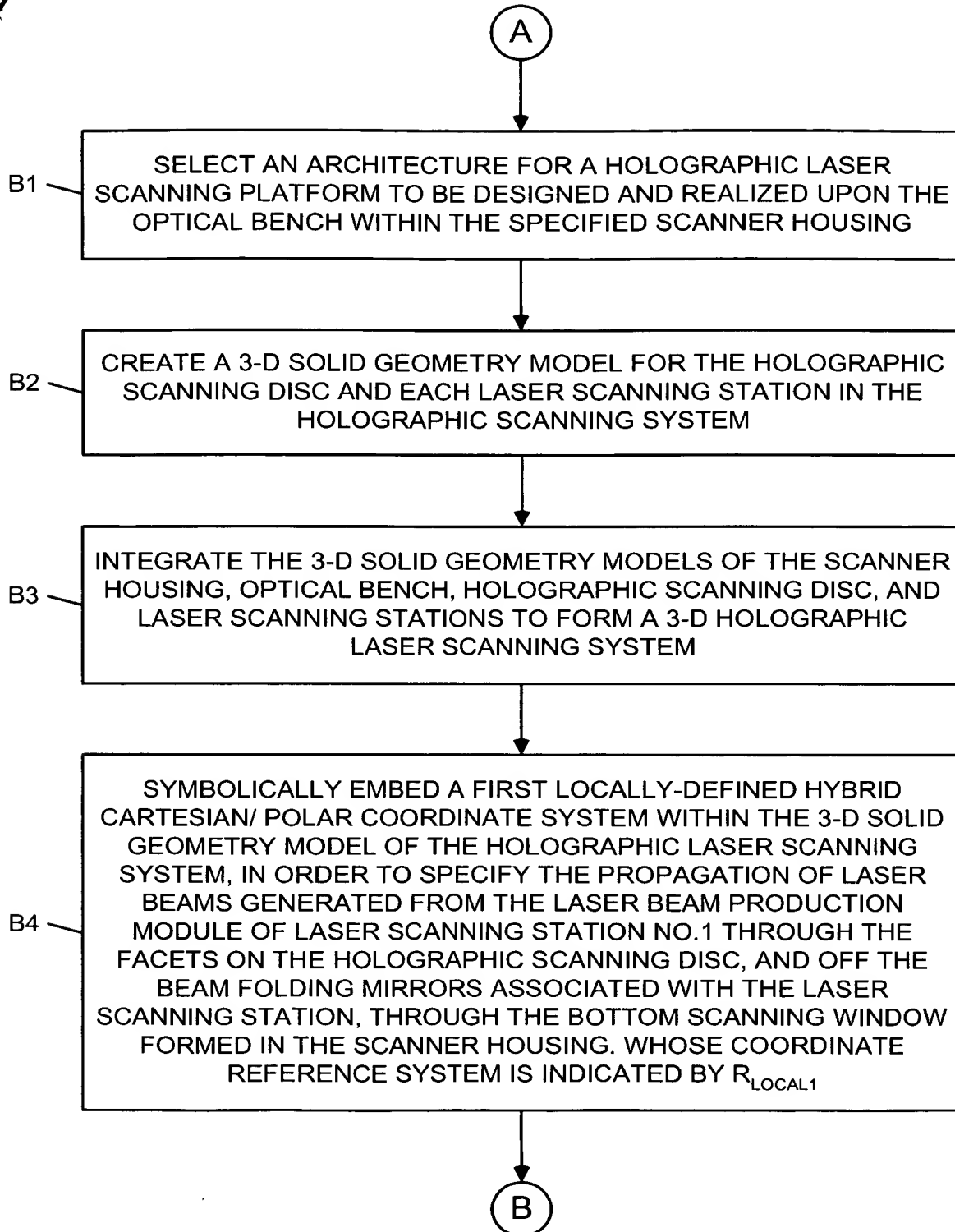
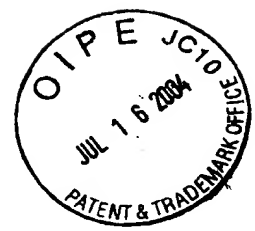


FIG. 7B

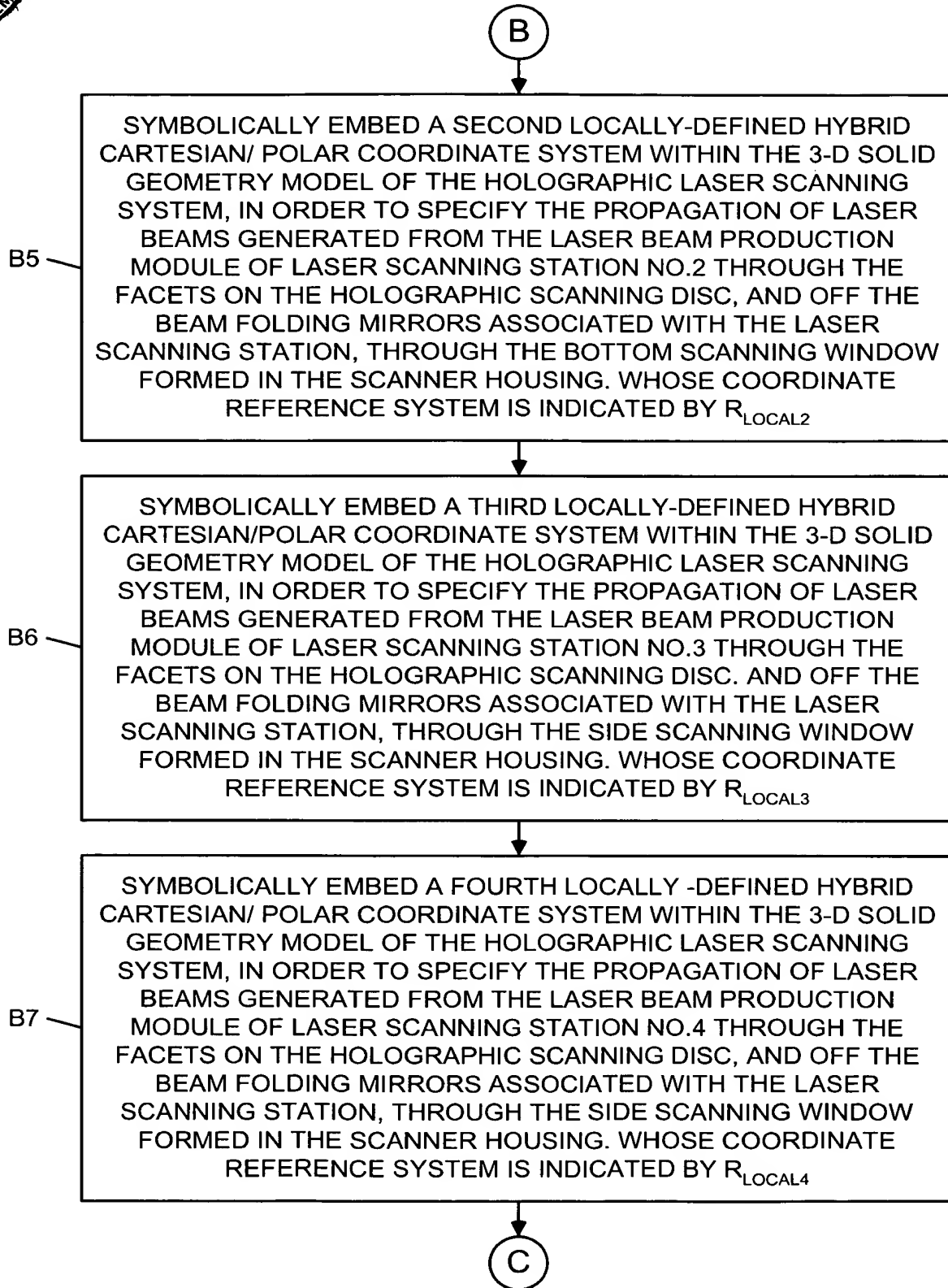
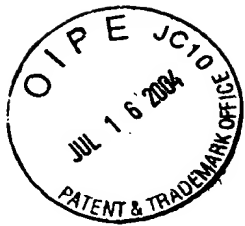


FIG. 7C

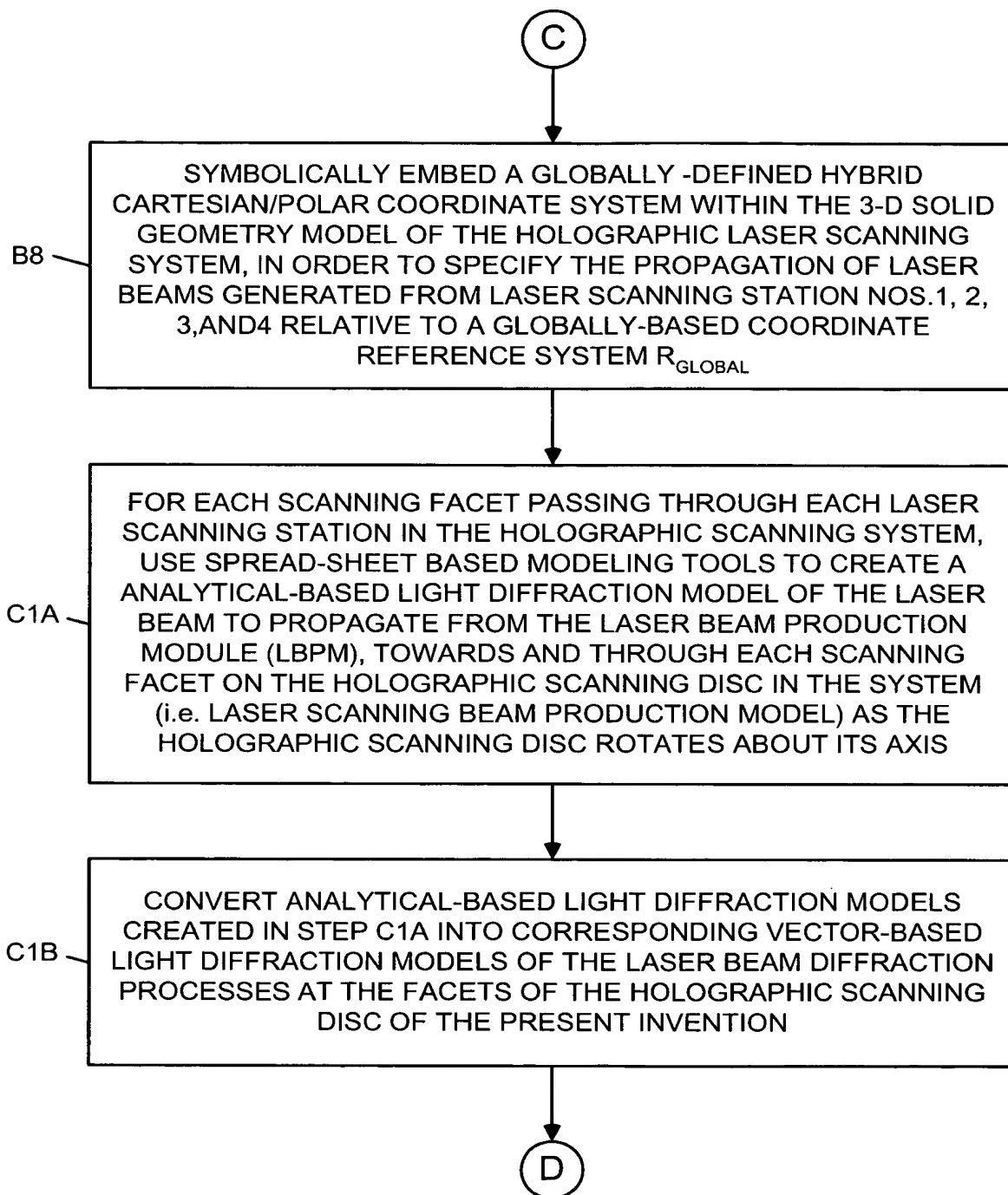
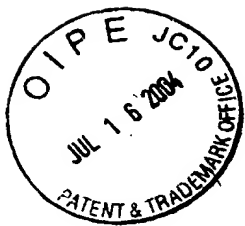


FIG. 7D

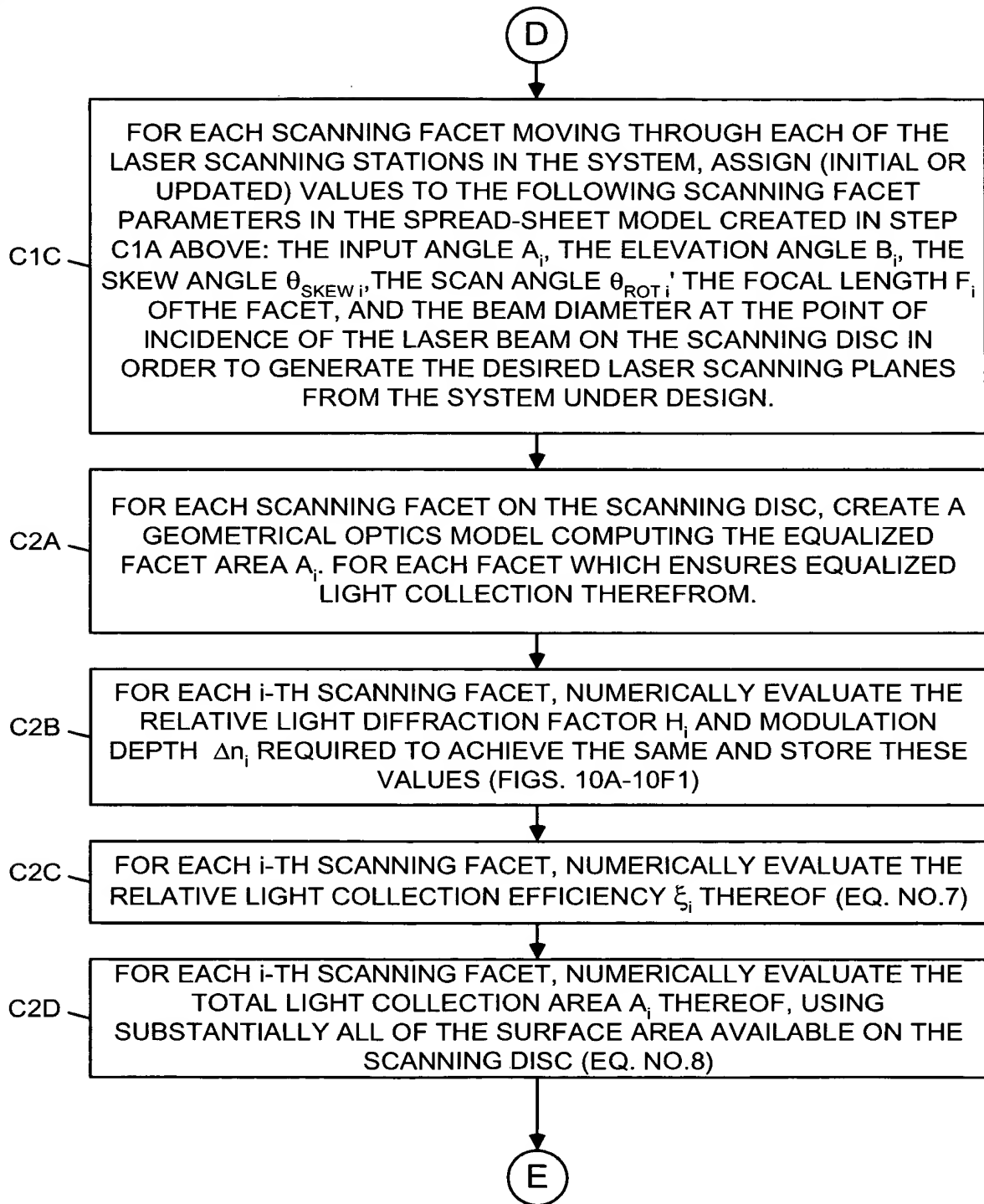


FIG. 7E

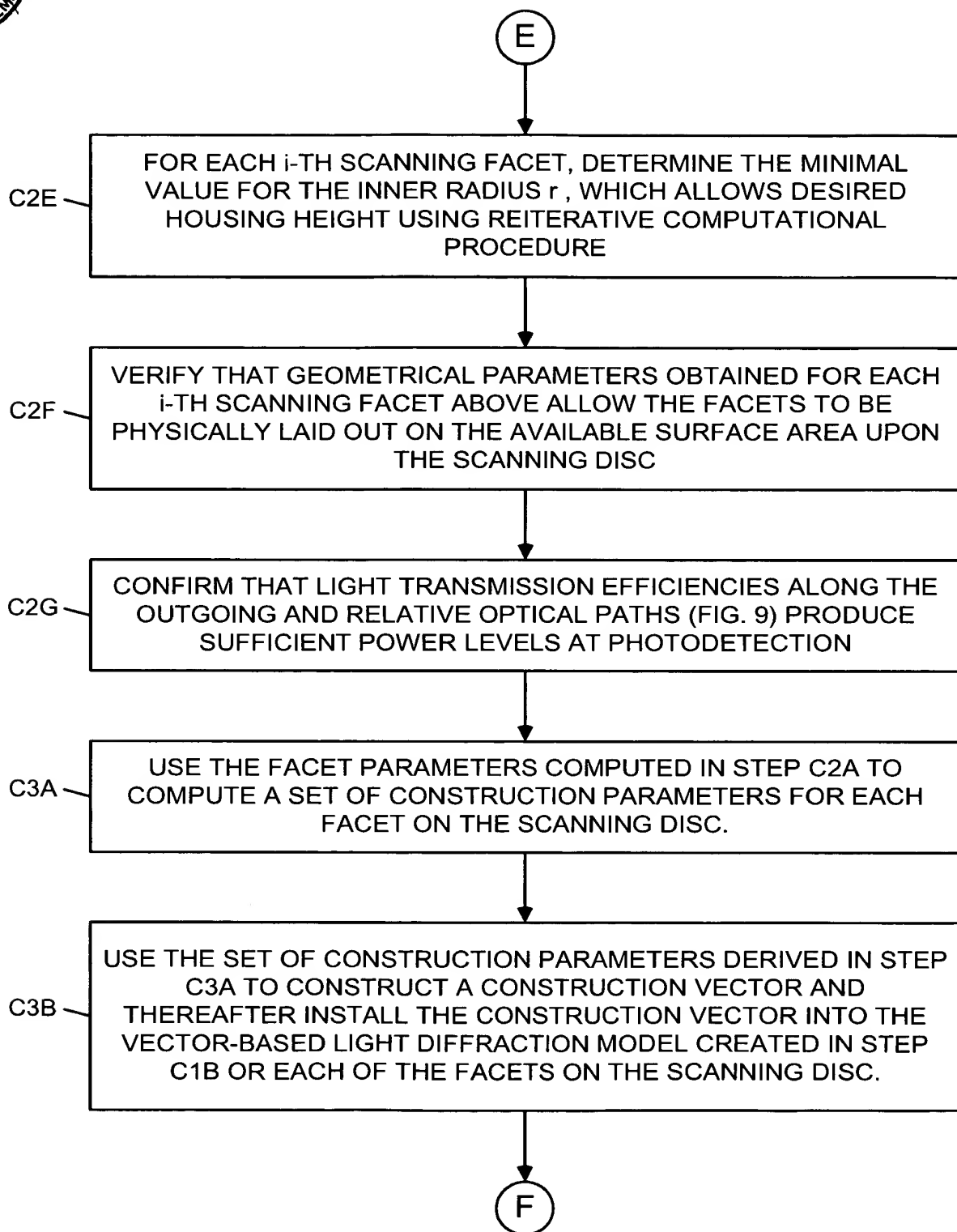
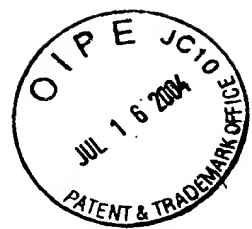


FIG. 7F

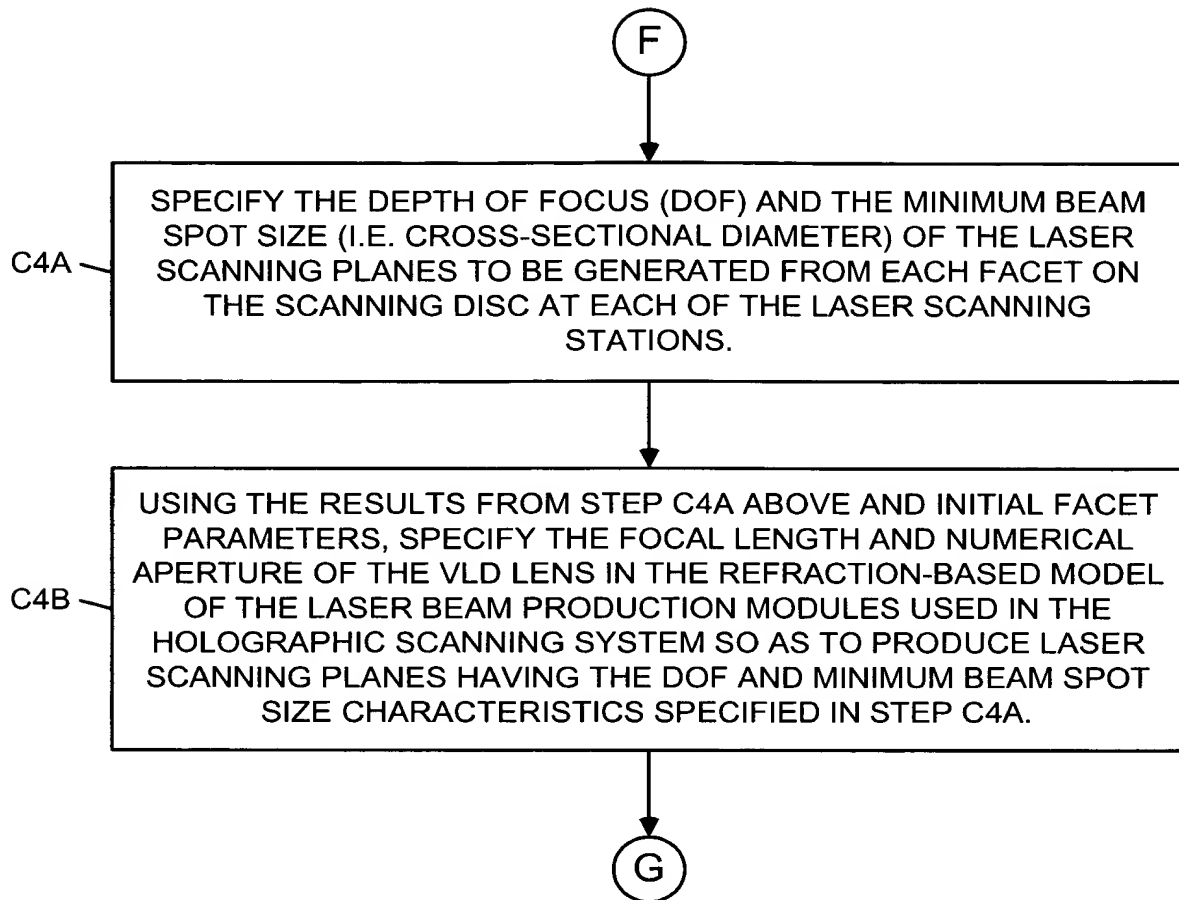
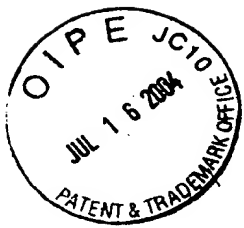


FIG. 7G

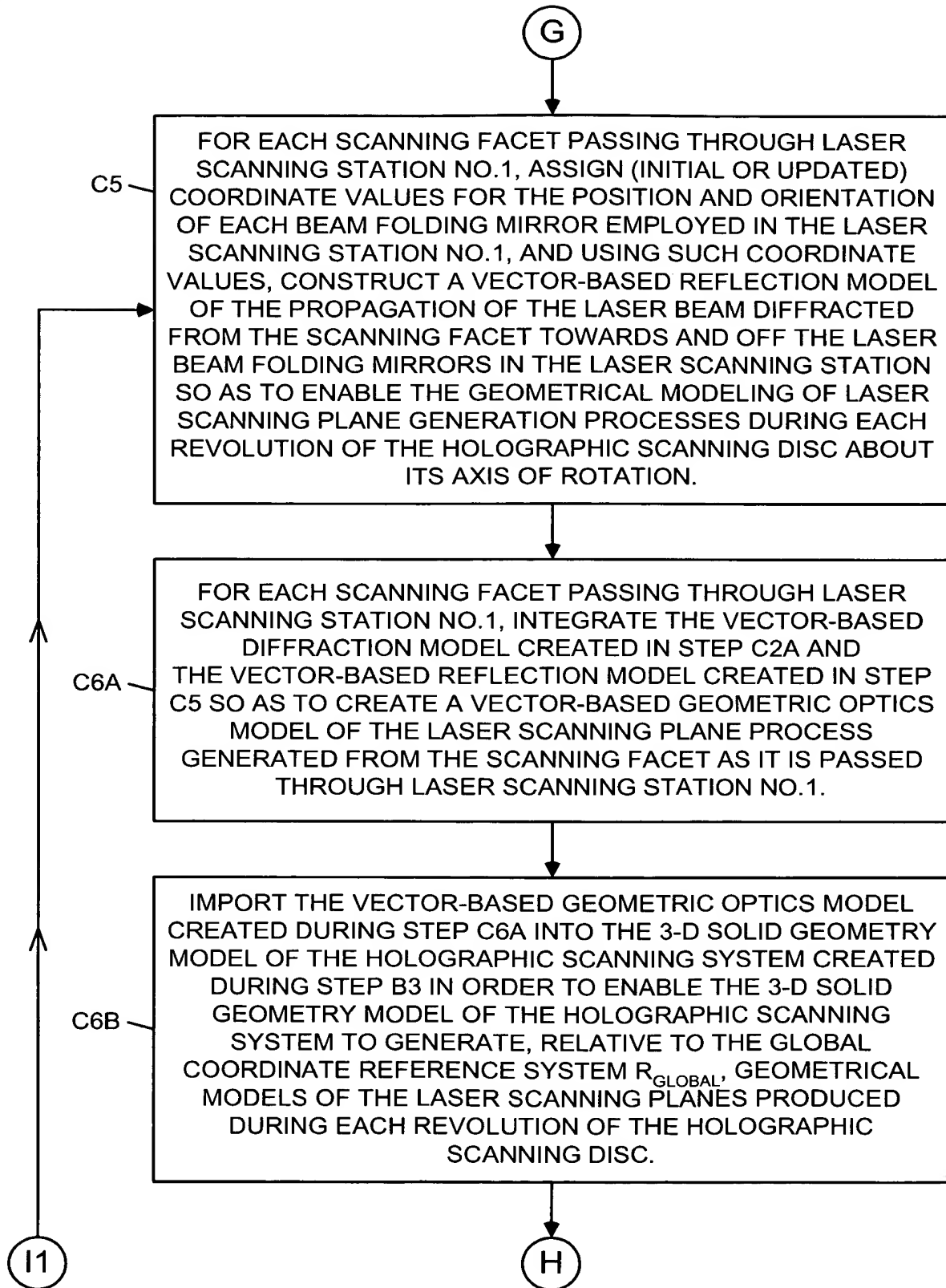


FIG. 7H

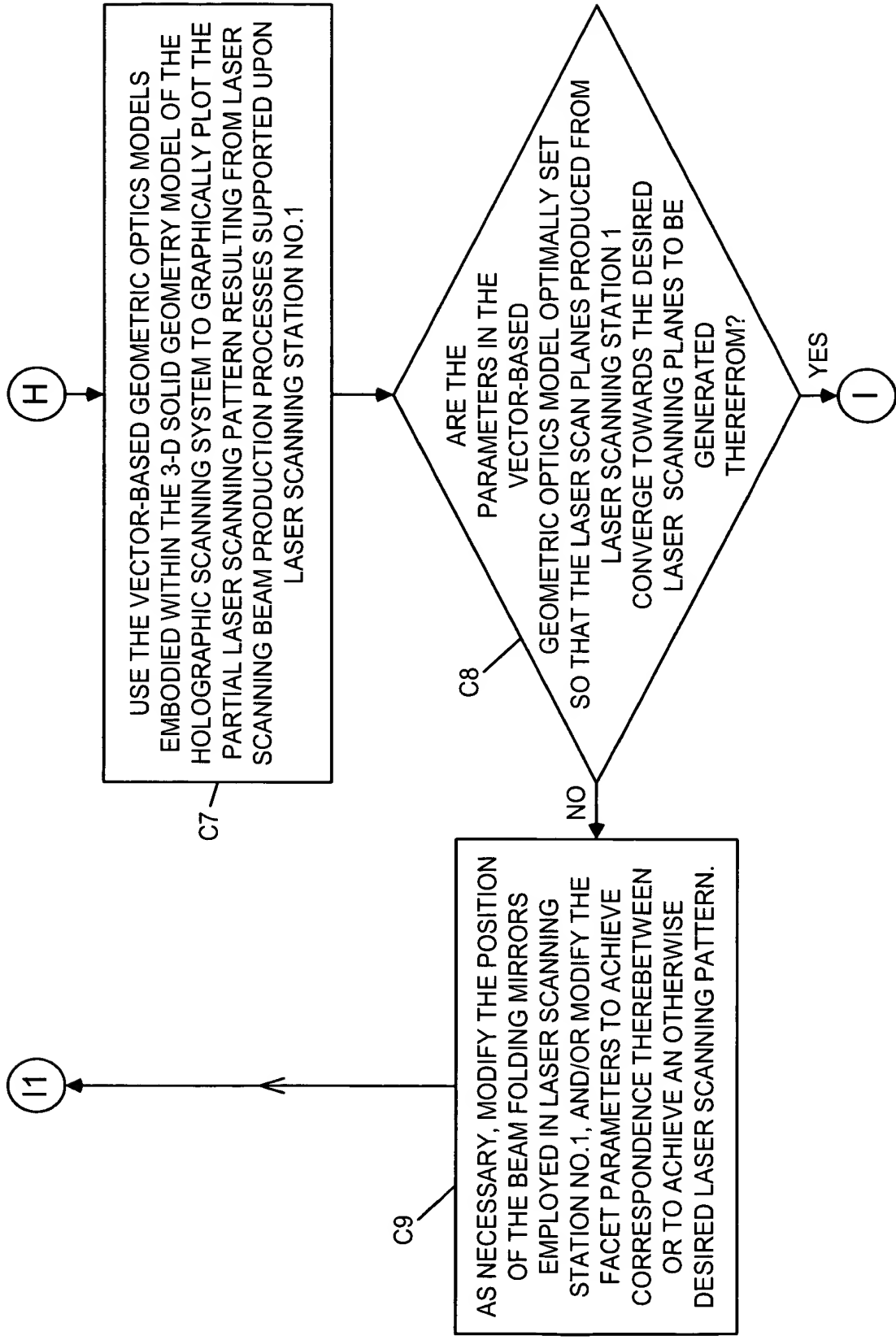


FIG. 7I

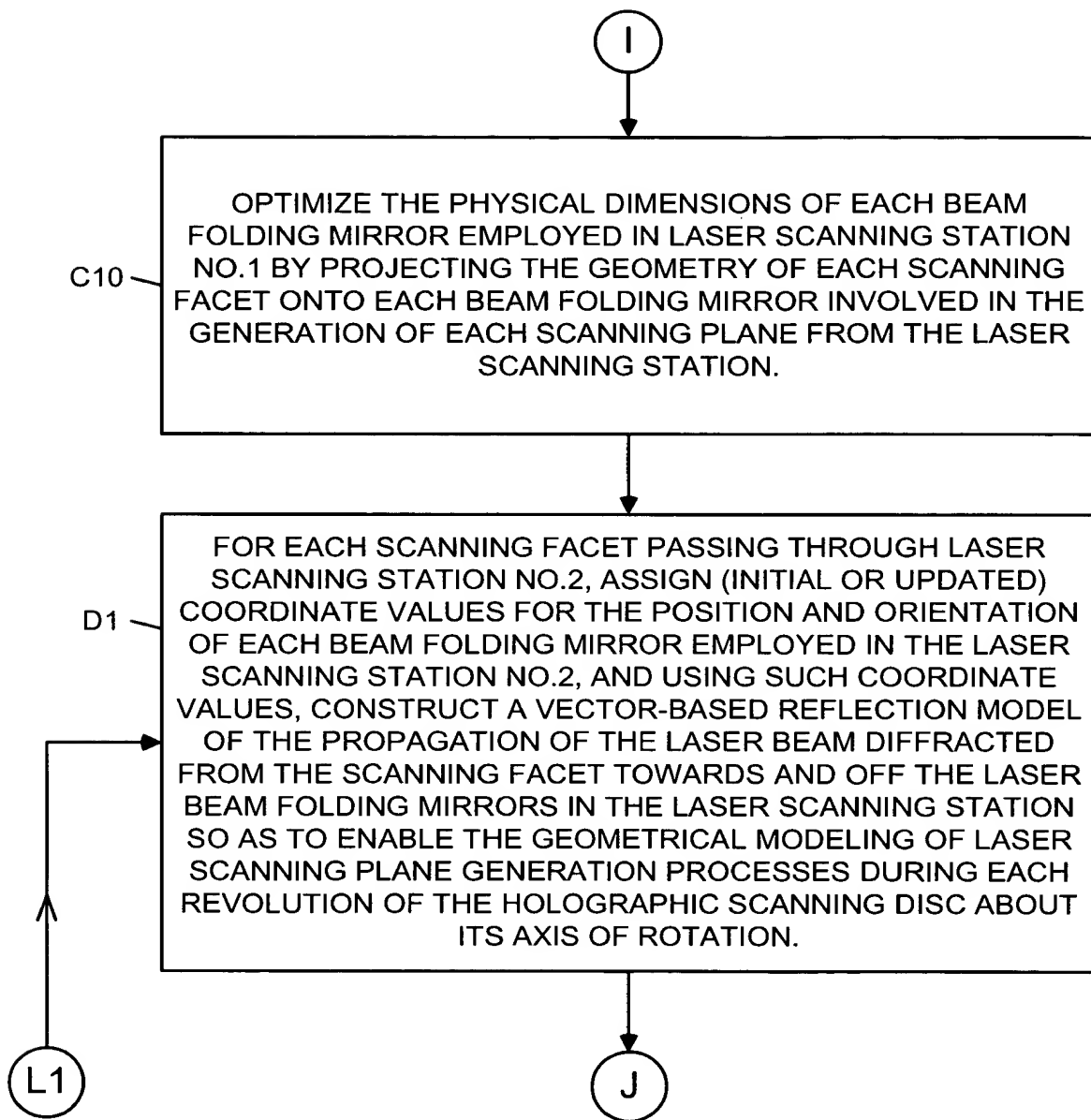
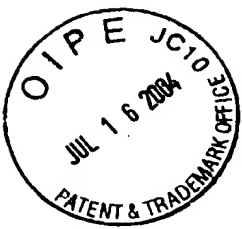


FIG. 7J

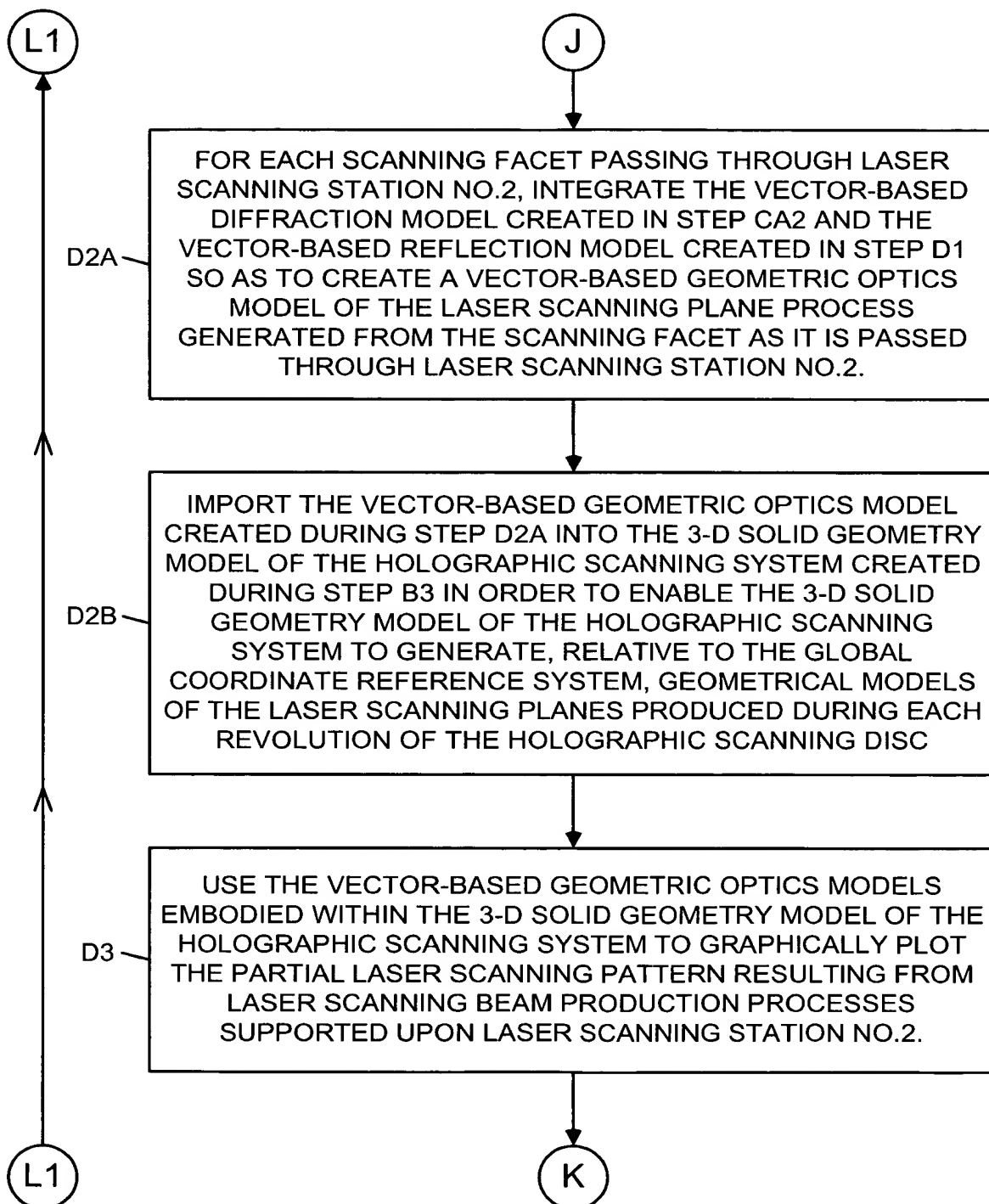
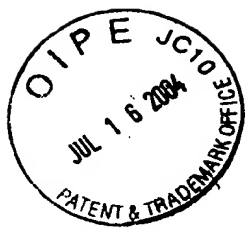
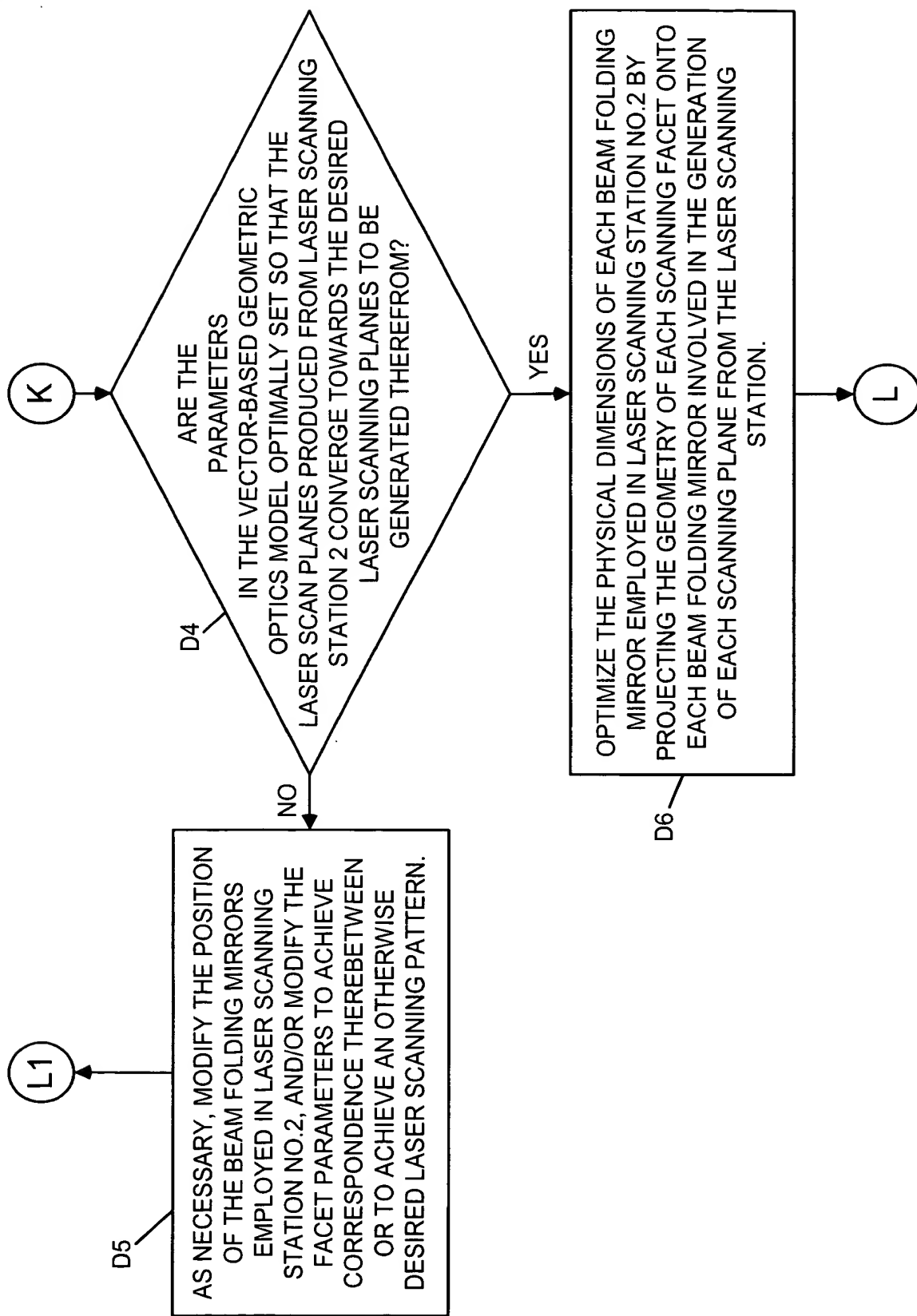


FIG. 7K



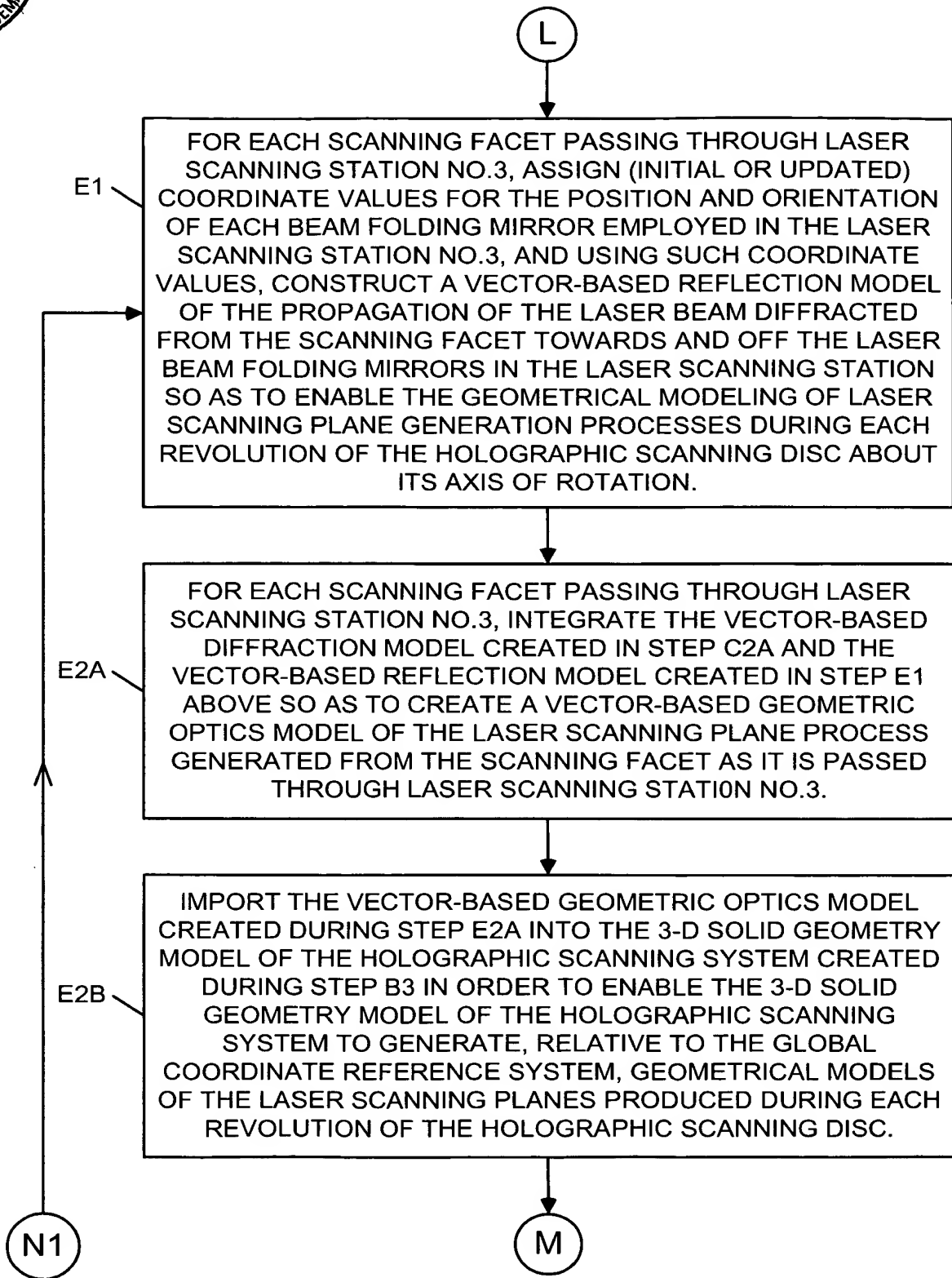
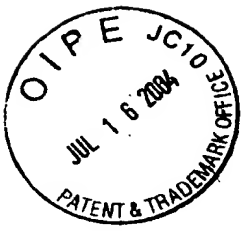


FIG. 7M

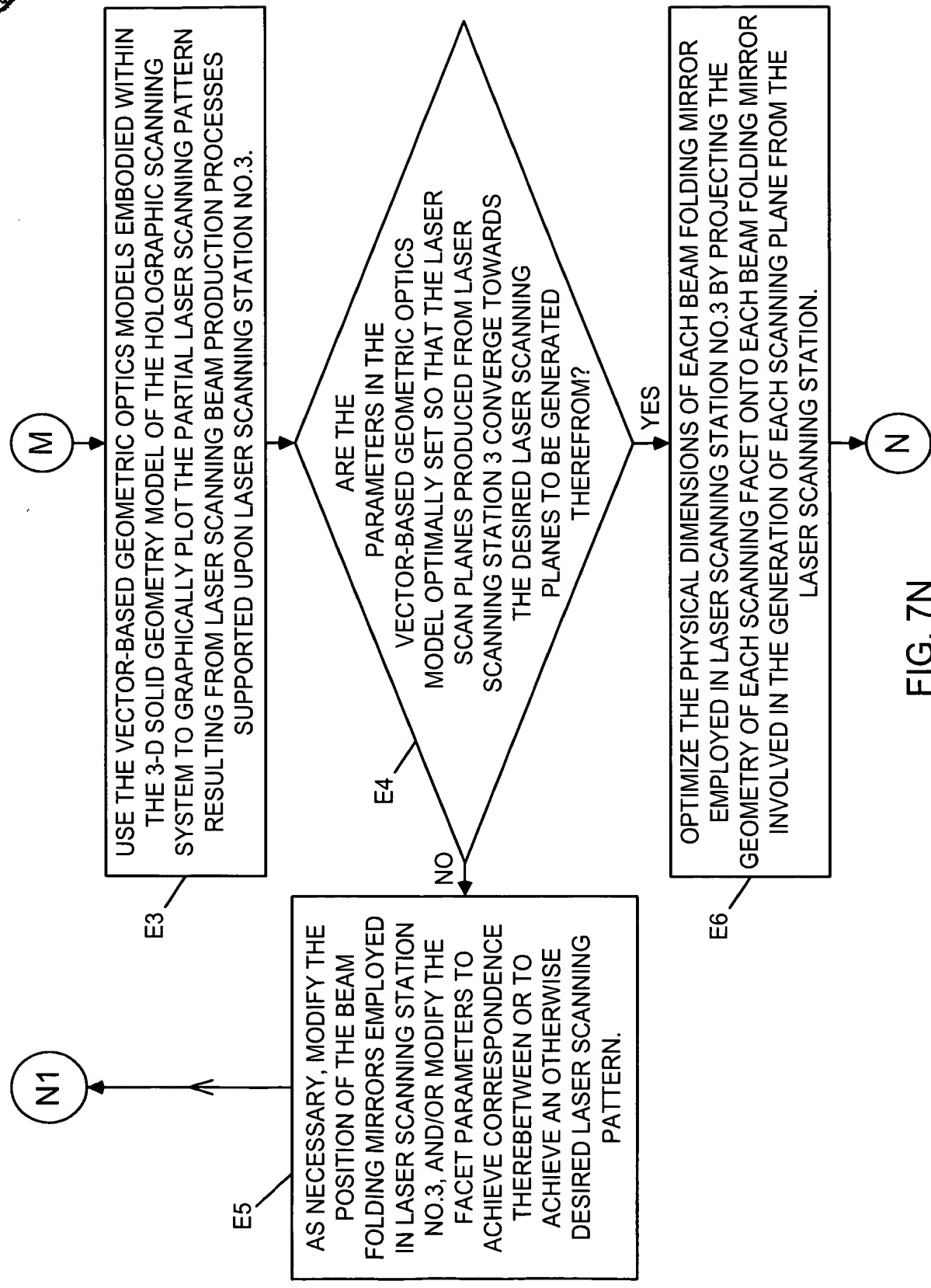


FIG. 7N

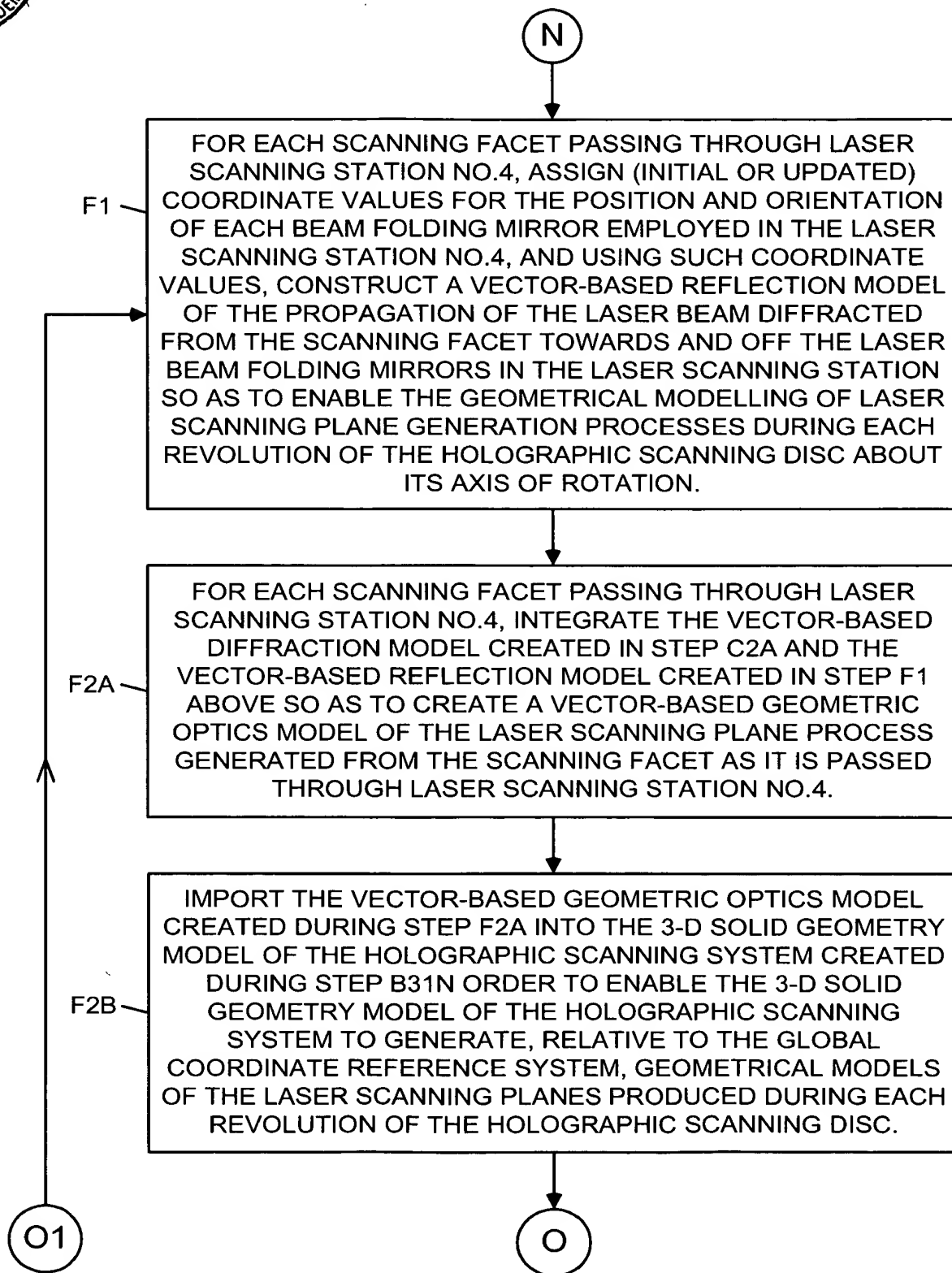
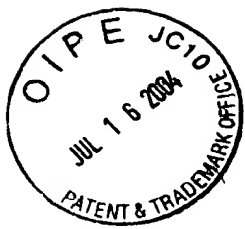


FIG. 70

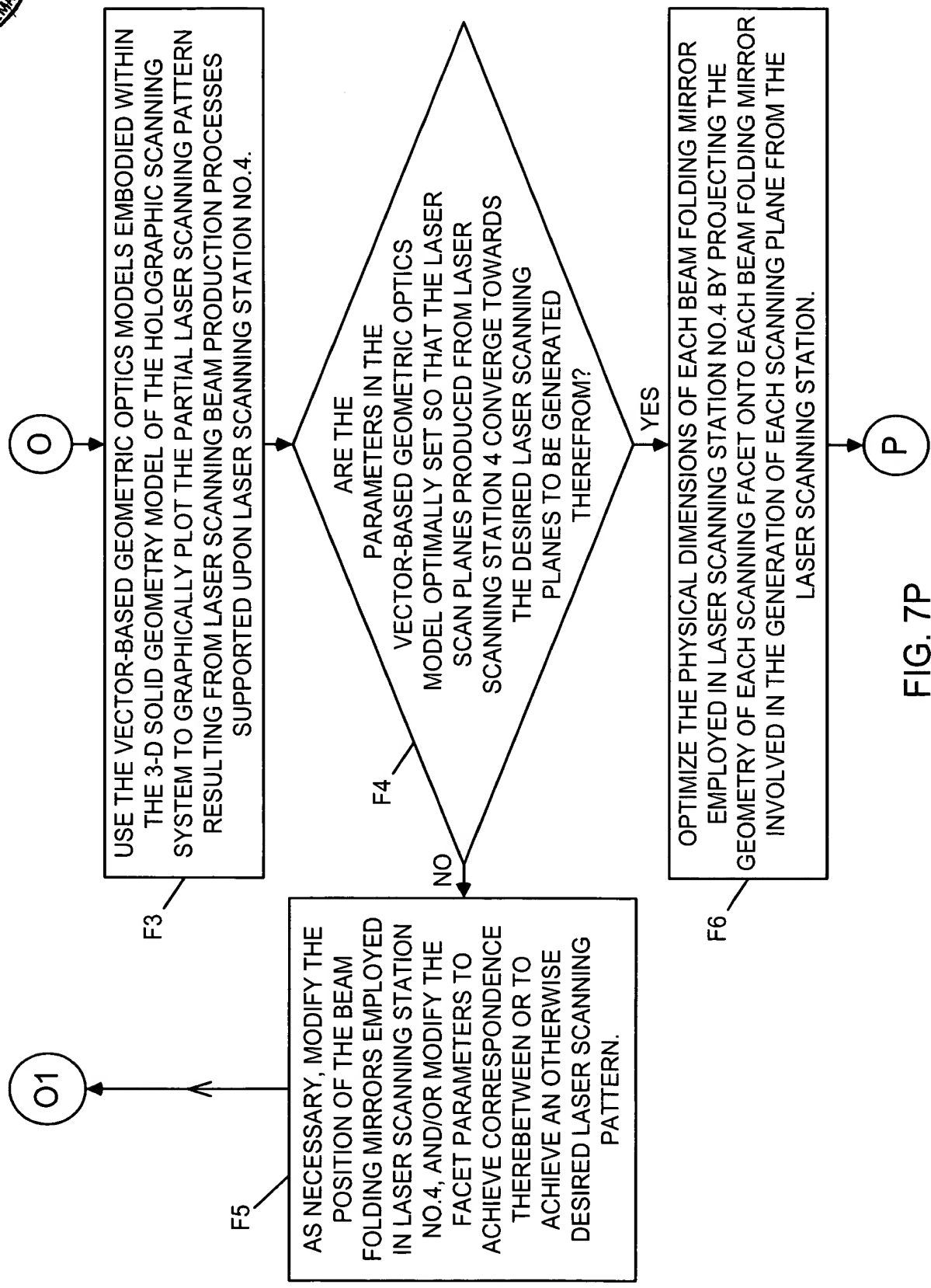


FIG. 7P

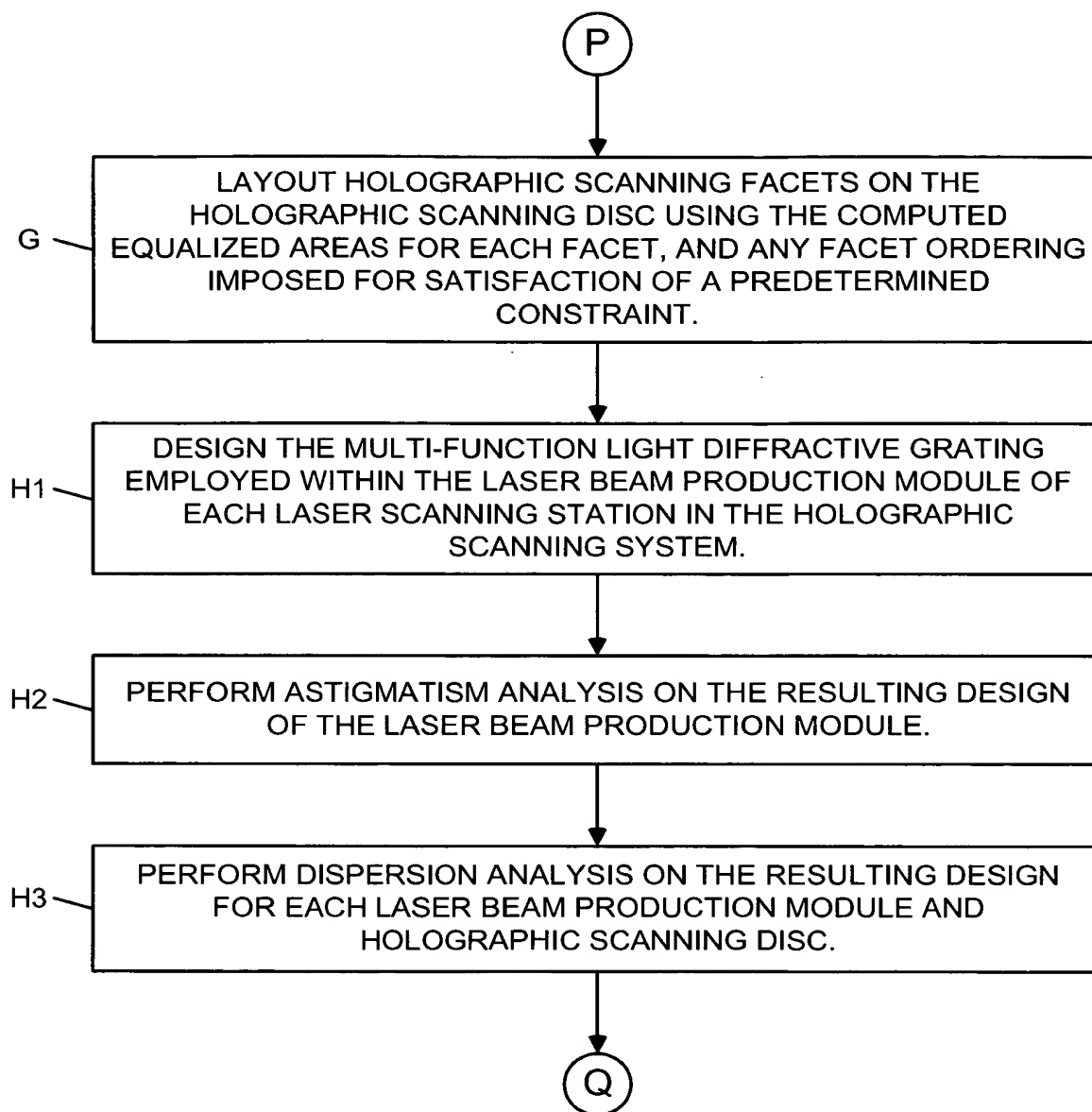
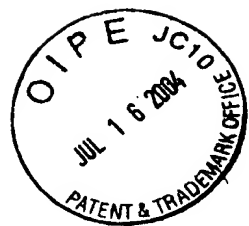


FIG. 7Q

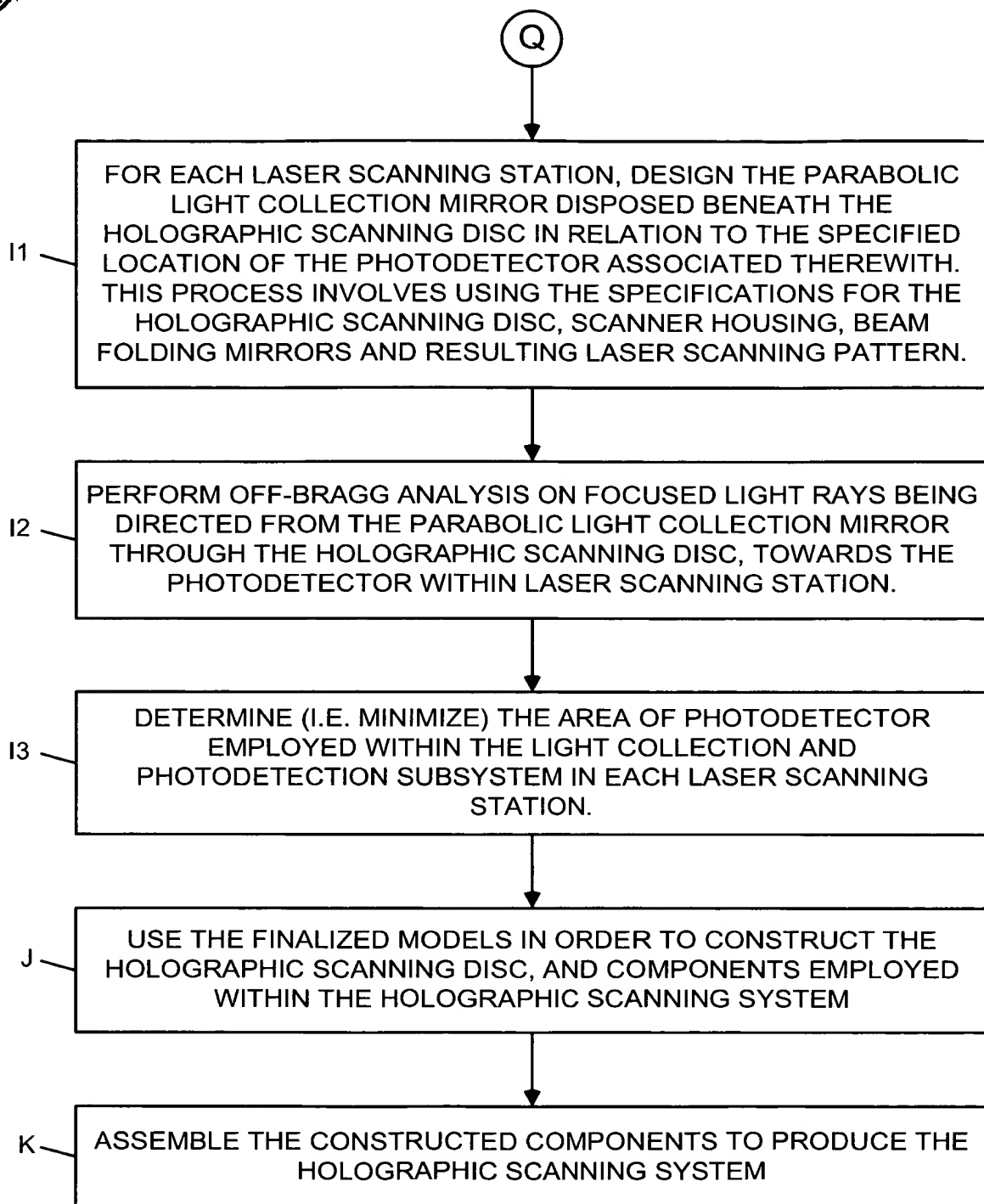
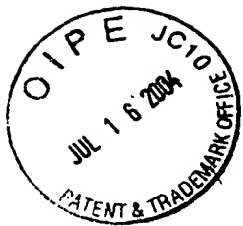


FIG. 7R

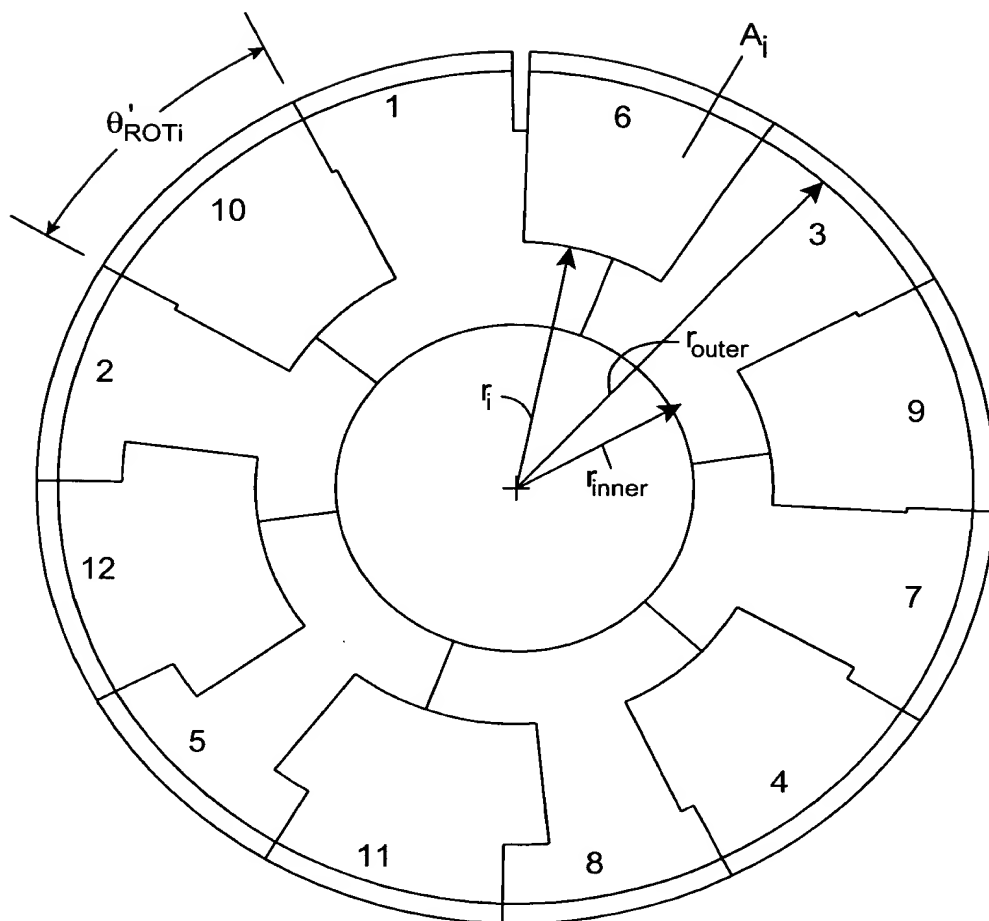


FIG. 8A

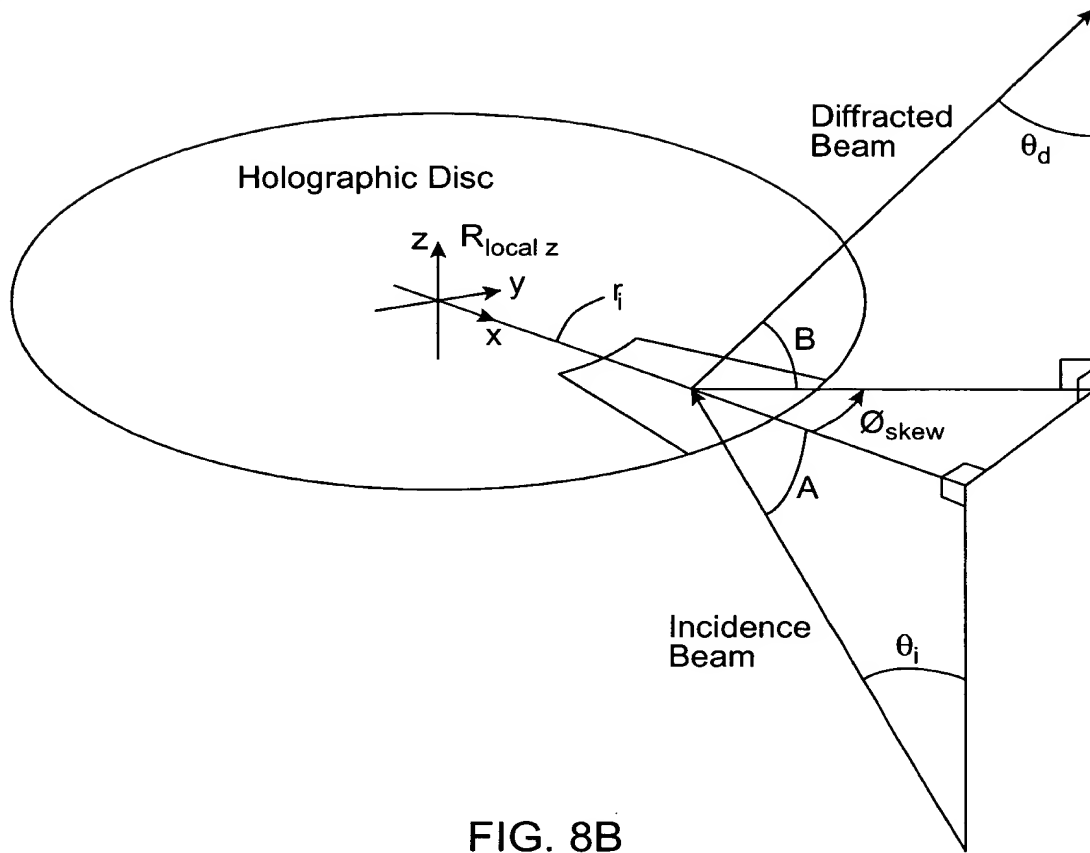
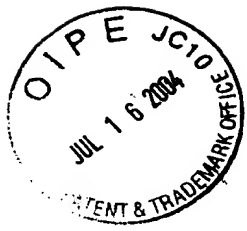


FIG. 8B

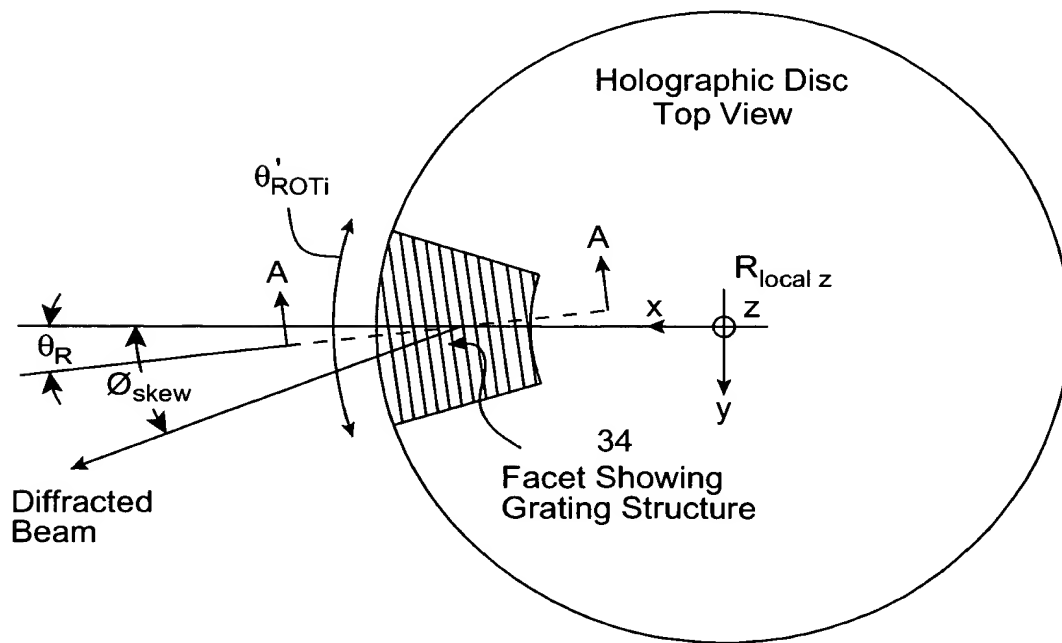
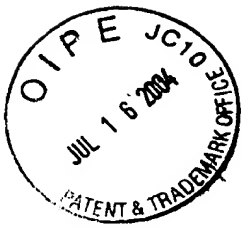
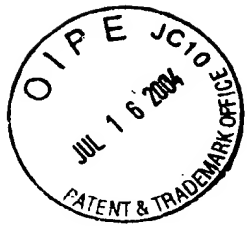


FIG. 8C



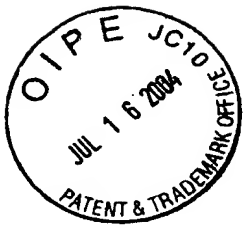
- (1) THE RADIUS TO BEAM-INCIDENT-POINT ON THE HOLOGRAPHIC SCANNING DISC, ASSIGNED THE SYMBOLIC NOTATION " r_0 "
- (2) THE DISTANCE FROM RADIUS TO BEAM-INCIDENT-POINT r_0 TO BEAM FOLDING MIRROR, ASSIGNED THE SYMBOLIC NOTATION " L "
- (3) THE FACET NO. ON THE HOLOGRAPHIC SCANNING DISC, ASSIGNED THE SYMBOLIC NOTATION " i "
- (4) THE DISTANCE FROM THE BEAM INCIDENT POINT ON THE VIRTUAL SCANNING DISC TO THE FOCAL PLANE WITHIN WHICH THE (i, j) -TH SCANLINE RESIDES, ASSIGNED THE SYMBOLIC NOTATION " f_i "
- (5) THE DIAMETER OF THE CROSS-SECTION OF THE LASER BEAM SCANNING STATION, ASSIGNED THE SYMBOLIC NOTATION " d_{BEAM} "
- (6) THE ANGULAR GAP BETWEEN ADJACENT HOLOGRAPHIC SCANNING FACETS, ASSIGNED THE SYMBOLIC NOTATION " d_{GAP} "
- (7) THE OUTER RADIUS OF THE AVAILABLE LIGHT COLLECTION REGION ON THE HOLOGRAPHIC SCANNING DISC, ASSIGNED THE SYMBOLIC NOTATION " r_{OUTER} "
- (8) THE INNER RADIUS OF THE AVAILABLE LIGHT COLLECTION REGION ON THE HOLOGRAPHIC SCANNING FACET, ASSIGNED THE SYMBOLIC NOTATION " r_{INNER} "
- (9) THE FOCAL LENGTH OF THE i -TH HOLOGRAPHIC SCANNING FACET FROM THE SCANNING FACET TO THE CORRESPONDING FOCAL PLANE WITHIN THE SCANNING VOLUME, ASSIGNED THE SYMBOLIC NOTATION " f_i "
- (10) INCIDENT BEAM ANGLE, ASSIGNED THE SYMBOLIC NOTATION " A_i "

FIG. 8D1



- (11) DIFFRACTED BEAM ANGLE, ASSIGNED THE SYMBOLIC NOTATION " B_i "
- (12) THE SCAN ANGLE OF THE LASER BEAM, ASSIGNED THE SYMBOLIC NOTATION " θ_{si} "
- (13) THE SCAN MULTIPLICATION FACTOR FOR THE i-TH HOLOGRAPHIC FACET, ASSIGNED THE SYMBOLIC NOTATION " M_i "
- (14) THE FACET ROTATION ANGLE FOR THE i-TH HOLOGRAPHIC FACET, ASSIGNED THE SYMBOLIC NOTATION " θ_{roti} "
- (15) ADJUSTED FACET ROTATION ANGLE ACCOUNTING FOR DEADTIME, ASSIGNED THE SYMBOLIC NOTATION " θ'_{roti} "
- (16) THE LIGHT COLLECTION EFFICIENCY FACTOR FOR THE i-TH HOLOGRAPHIC FACET, NORMALIZED RELATIVE TO THE 16TH FACET, ASSIGNED THE SYMBOLIC NOTATION " ξ_i "
- (17) THE MAXIMUM LIGHT COLLECTION AREA FOR THE i-TH HOLOGRAPHIC FACET, ASSIGNED THE SYMBOLIC NOTATION " $Area_i$ "
- (18) THE ANGLE OF SKEW OF THE DIFFRACTED LASER BEAM AT THE CENTER OF THE i-TH HOLOGRAPHIC FACET, ASSIGNED THE SYMBOLIC NOTATION " ϕ_{skew} "

FIG. 8D2



PARAMETER EQUATION USED IN THE SPREADSHEET DESIGN OF THE SCANNER

- (1) f_i Focal Length - f_{i-th} facet
- (2) B_i Elevation Angle; $\theta_{dif\ i} = 90 - B_i$
- (3) θ_{Si}
- (4) $M_i := \frac{r_0}{r_i} \cos(\theta_{skew}) + \cos(\lambda_i) + \cos(B_i)$
- (5) $\theta_{roti} := \frac{\theta_{Si}}{M_i}$
- (6) $\theta'_{roti} := \theta_{roti} + \underbrace{\frac{d_{beam}}{r_0} + \frac{d_{gap}}{r_0}}_{\Theta_{dead}}$
- (7) $\xi_i := \left[\frac{f_i}{f_{20}} \right] \frac{\sin[B_{20}]}{\sin(B_i)} H_i$
- (8) $Area_i := \pi \left[r_{outer}^2 + r_{inner}^2 \right] \frac{\xi_i}{\sum_{i=1}^{20} [\xi_i]} \quad i = 1, 2, \dots, 20$

FIG. 8E

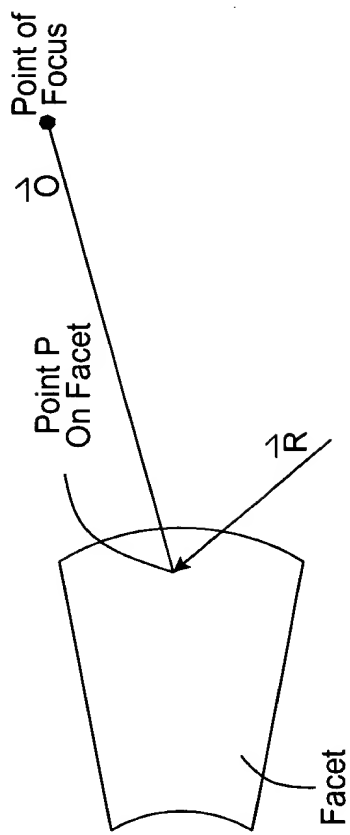


FIG. 8F1

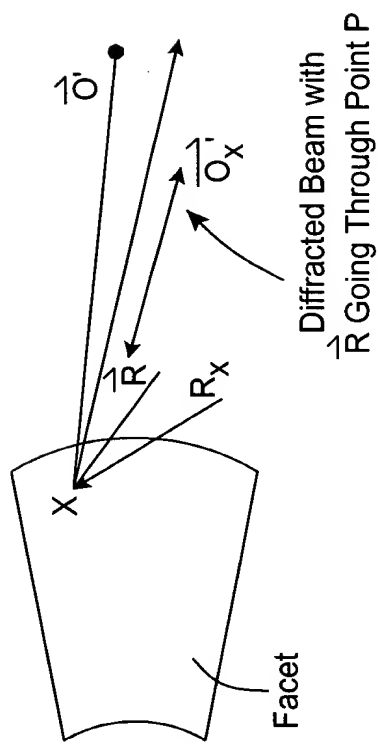
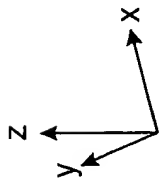


FIG. 8F2



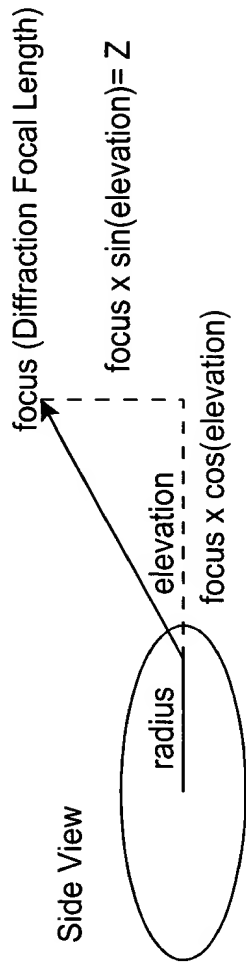
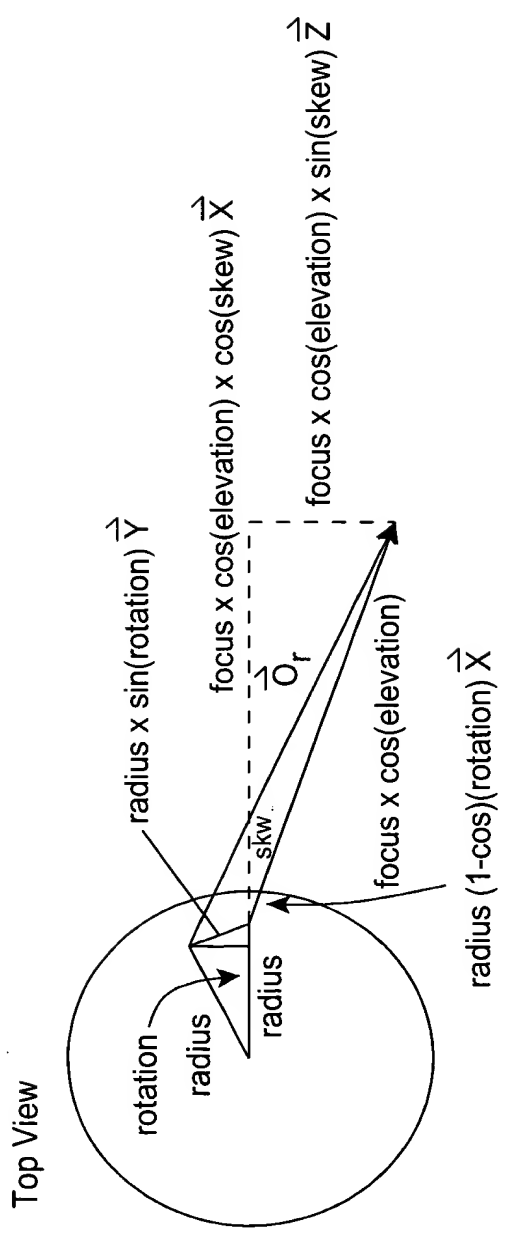
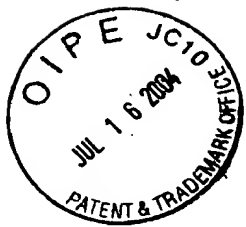


FIG. 8F3



(\vec{O}_r is equal to the sum of these components)

FIG. 8F4



Object Ray \vec{O}_P Composition:

$$\begin{aligned}\vec{O}_P = & [\text{focus} \times \cos(\text{elevation}) \times \cos(\text{skew}) + \text{radius}(1 - \cos(\text{rotation}))]\vec{X} \\ & + [\text{focus} \times \cos(\text{elevation}) \times \sin(\text{skew}) + \text{radius} \times \sin(\text{rotation})]\vec{Y} \\ & + [\text{focus} - \sin(\text{elevation})]\vec{Z}\end{aligned}$$

Where focus = the diffraction

elevation = elevation angle of facet

skew = skew angle of facet

radius = radius to point P

rotation = start-middle-end of scan angles

FIG. 8F5



	A	B	C	D	E	F	G	H	I
788	*** Optical Power at the Data Detector and Resulting Signal Levels ***								
789									
790	Calculation of the power at the data detector for targets located at the focal planes								
791	and targets located at the maximum depth of field limits for each facet.								
792	Assumes average angular offset of: 0.7 degrees								
793	(Offset of outgoing beam from center of facet)								
794									(At focal plane)
795		Laser	Transm. of	Refl. of	Diff. Eff. of	S - diff. eff. of	S - refl. of	Trans. of	Lambertian
796	Facet	Power	collimating	first	MF plate	holographic	second, third	Window	reflectance
797		(mW)	lens	mirror		facet	& fourth mirror		factor
798									
799		3.36	0.46	0.95	0.85		0.97	0.8	
800	1		(This includes the			0.89			0.0027739
801	2		truncation losses)			0.89			0.0027279
802	3					0.89			0.0026841
803	4					0.90			0.0026424
804	5					0.90			0.0025657
805	6					0.90			0.0024980
806	7					0.90			0.0024122
807	8					0.90			0.0024122
808	9					0.90			0.0023874
809	10					0.90			0.0023874
810	11					0.90			0.0023645
811	12					0.90			0.0023645

FIG. 9A



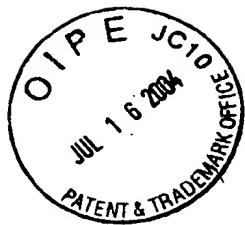
	J	K	L	M	N	O	P	Q	R	S
788										
789										
790										
791										
792	(At maximum depth of field)									
793	Lambertian reflectance	Diffuse Refl. of bar code	Average of P and S - refl. of second, third & fourth mirror	Average of P and S - diff. eff. of holographic facet	Refl. of parabolic mirror	Trans. of hol. facet off-Bragg	Trans. of polarizing filter (none used)	Power at window (mW)	Power at detector (nW)	depth of field)
794	Lambertian reflectance	Diffuse Refl. of bar code	Average of P and S - refl. of second, third & fourth mirror	Average of P and S - diff. eff. of holographic facet	Refl. of parabolic mirror	Trans. of hol. facet off-Bragg	Trans. of polarizing filter (none used)	Power at window (mW)	Power at detector (nW)	depth of field)
795	Lambertian reflectance	Diffuse Refl. of bar code	Average of P and S - refl. of second, third & fourth mirror	Average of P and S - diff. eff. of holographic facet	Refl. of parabolic mirror	Trans. of hol. facet off-Bragg	Trans. of polarizing filter (none used)	Power at window (mW)	Power at detector (nW)	depth of field)
796	Lambertian reflectance	Diffuse Refl. of bar code	Average of P and S - refl. of second, third & fourth mirror	Average of P and S - diff. eff. of holographic facet	Refl. of parabolic mirror	Trans. of hol. facet off-Bragg	Trans. of polarizing filter (none used)	Power at window (mW)	Power at detector (nW)	depth of field)
797	Lambertian reflectance	Diffuse Refl. of bar code	Average of P and S - refl. of second, third & fourth mirror	Average of P and S - diff. eff. of holographic facet	Refl. of parabolic mirror	Trans. of hol. facet off-Bragg	Trans. of polarizing filter (none used)	Power at window (mW)	Power at detector (nW)	depth of field)
798	Lambertian reflectance	Diffuse Refl. of bar code	Average of P and S - refl. of second, third & fourth mirror	Average of P and S - diff. eff. of holographic facet	Refl. of parabolic mirror	Trans. of hol. facet off-Bragg	Trans. of polarizing filter (none used)	Power at window (mW)	Power at detector (nW)	depth of field)
799	Lambertian reflectance	Diffuse Refl. of bar code	Average of P and S - refl. of second, third & fourth mirror	Average of P and S - diff. eff. of holographic facet	Refl. of parabolic mirror	Trans. of hol. facet off-Bragg	Trans. of polarizing filter (none used)	Power at window (mW)	Power at detector (nW)	depth of field)
800	0.0018058	0.9	0.86		0.92	0.93	1	0.86	872	
801	0.0017176			0.69				0.86	873	
802	0.0017579			0.70				0.86	874	
803	0.0016637			0.71				0.86	874	
804	0.0016804			0.72				0.86	876	
805	0.0016002			0.75				0.86	877	
806	0.0016650			0.77				0.87	879	
807	0.0016650			0.79				0.87	879	
808	0.0015995			0.79				0.87	880	
809	0.0015995			0.80				0.87	880	
810	0.0016358			0.80				0.87	880	
811	0.0016358			0.81				0.87	880	
811	0.0016358			0.81				0.87	880	

FIG. 9B



	T	U	V	W	X	Y	Z	AA
788								
789								
790								(From
791	6.27						(From	maximum
792	(Targets located at the						focal	depth of
793	depth of field limits)						plane)	field)
794	Power at	Detector			Diffraction	Effective	Light	Light
795	detector	signal		Facet	Angle from	Radius of	Collection	Collection
796	(nW)	(Volts)		Collection	Center of	Collection	Half-	Half-
797				Area	Facet	Area	Angle	Angle
798				(sq. in.)	(degrees)	(inches)	(degrees)	(degrees)
799								
800	567	3.56		2.25	52.70	0.66	3.02	2.44
801	549	3.45		1.79	50.70	0.60	2.99	2.38
802	572	3.59		2.07	48.70	0.66	2.97	2.40
803	551	3.45		1.61	46.70	0.59	2.95	2.34
804	574	3.60		1.77	42.70	0.64	2.90	2.35
805	562	3.52		1.45	38.70	0.60	2.86	2.29
806	607	3.80		1.95	32.70	0.72	2.82	2.34
807	607	3.80		1.95	32.70	0.72	2.82	2.34
808	589	3.69		1.59	30.70	0.66	2.80	2.29
809	589	3.69		1.59	30.70	0.66	2.80	2.29
810	609	3.82		1.86	28.70	0.72	2.79	2.32
811	609	3.82		1.86	28.70	0.72	2.79	2.32

FIG. 9C



Geometrical Optics Model For Holographic (Total Out
And Back) Light Diffraction Efficiency Calculations

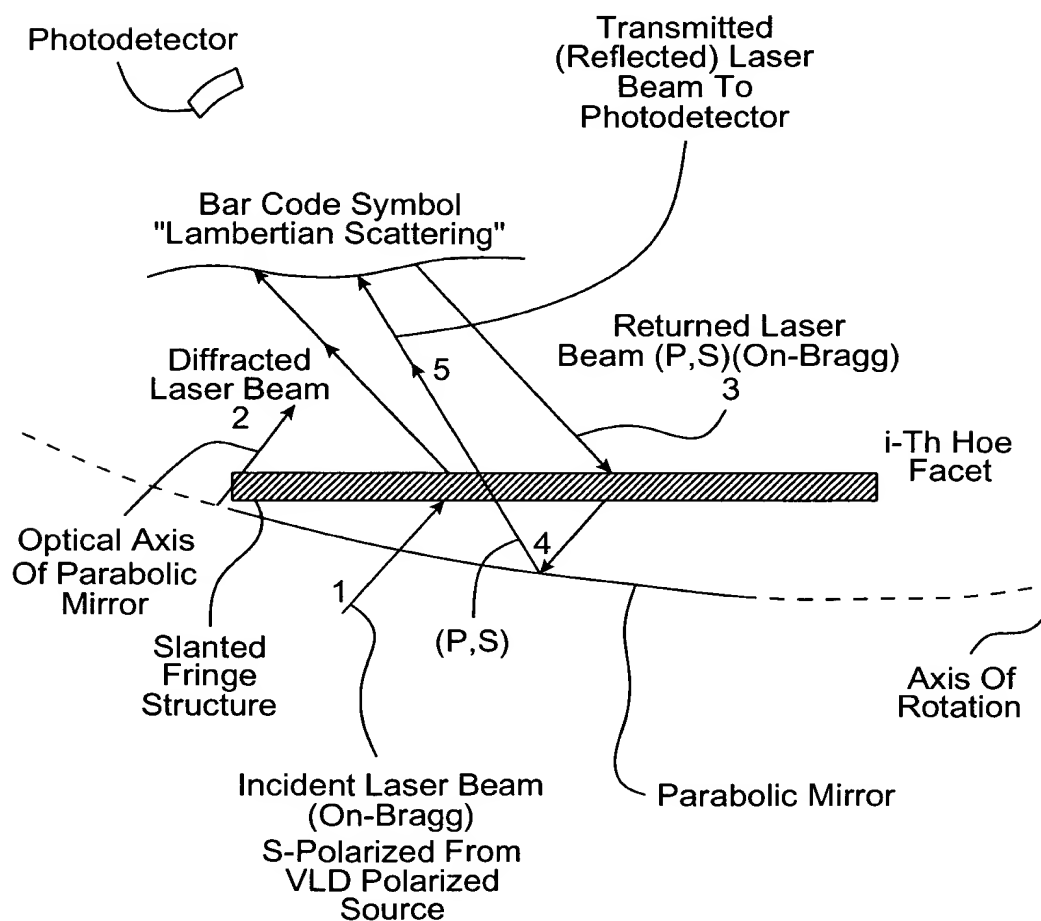


FIG. 10A1

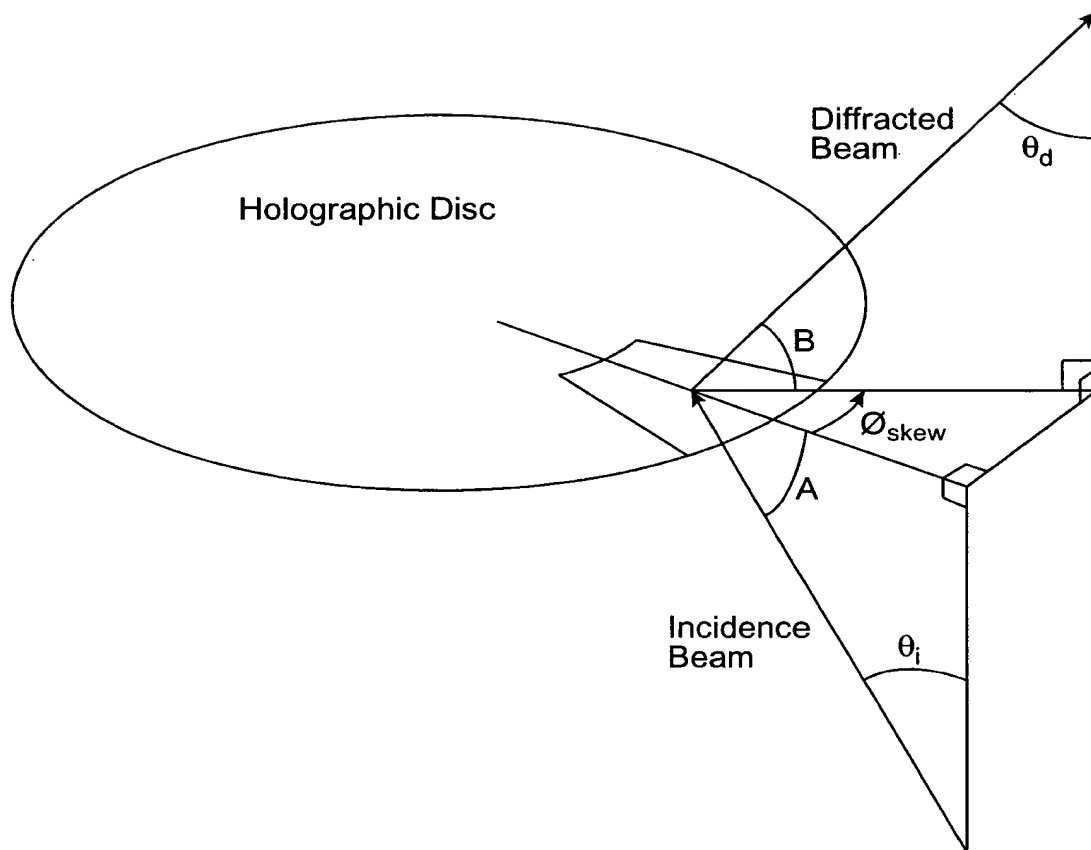
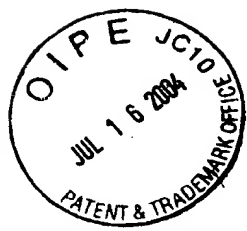


FIG. 10A2

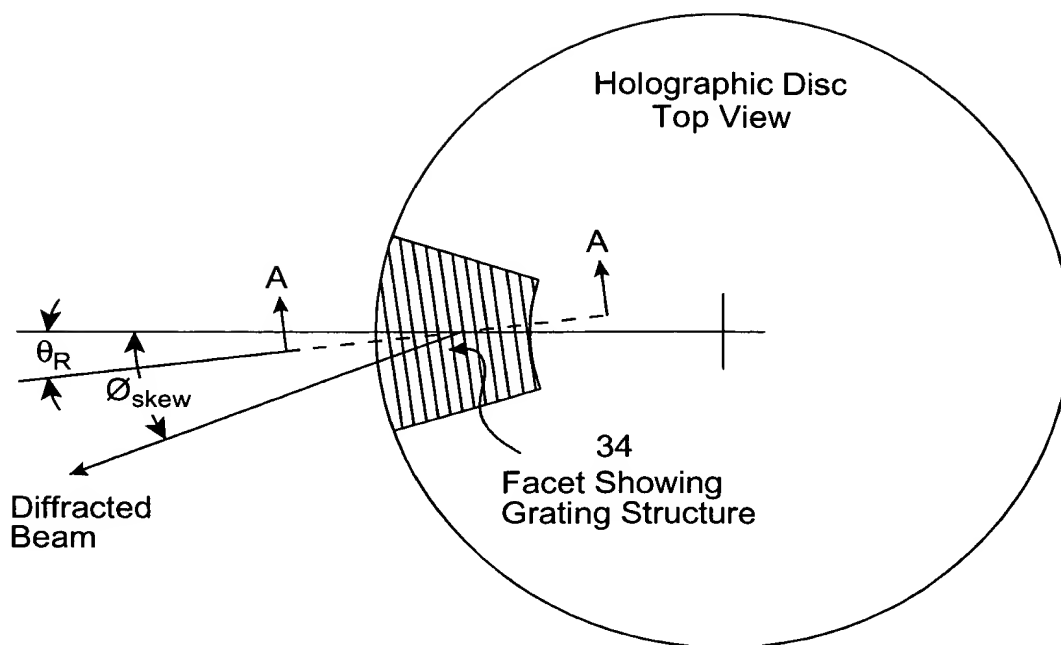
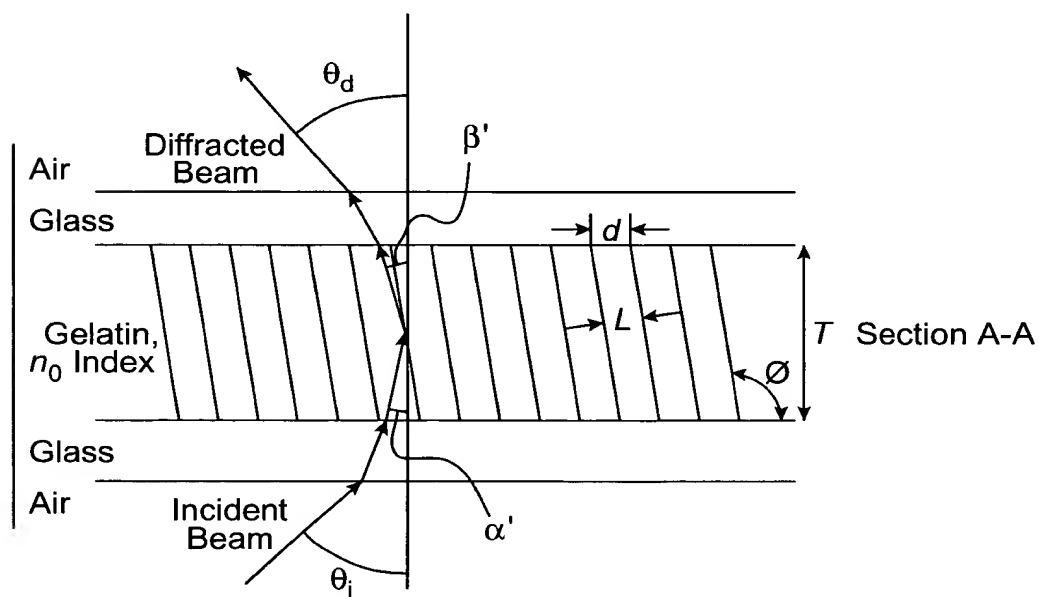
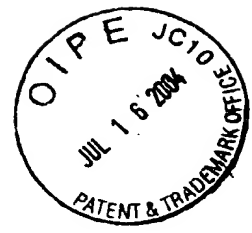


FIG. 10A3



Note: The Prime Attached To The Angles (e.g. α')
Indicates They Are Projected Into The viewing Plane A-A

FIG. 10A4



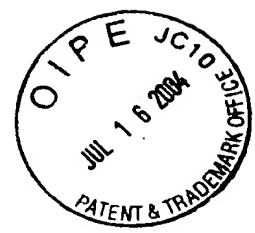
S AND P DIFFRACTION EFFICIENCY ANALYSIS **FOR THE MOST GENERAL CASE**

The following analysis takes into consideration slanted fringes, skewed design, off-Bragg effects, and disc rotation effects. It is assumed that the wavelength does not deviate from the design, and that all scattering, absorption, and reflection losses are taken into account by the transmission coefficients, t_s and t_p , which are determined by measurement.

Definitions:

- θ_i = Angle of incidence outside the HOE ($\theta_i = 90^\circ - A$);
- α = Angle of incidence inside the HOE;
- θ_d = Angle of diffraction outside the HOE ($\theta_d = 90^\circ - B$);
- β = Angle of diffraction inside the HOE;
- ϕ_{skew} = Skew angle of the HOE;
- ϕ = Tilt of Bragg planes ($\phi = \pi/2$ for no tilt);
- θ_R = Rotation angle of HOE grating ($\theta_R = \theta_{R0}$ when facet is centered)
- L = Separation of the Bragg planes;
- T = Thickness of the HOE medium;
- d = HOE surface fringe spacing;
- n_0 = Average refractive index of HOE medium;
- n_1 = Modulation (i.e. amplitude of periodic variation) of refractive index;
- λ_a = Laser wavelength in air;
- t_s = Transmission of S-polarization through disc considering losses;
- t_p = Transmission of P-polarization through disc considering losses.

FIG. 10B



- (1) $\alpha = \arcsin \left(\frac{\sin \theta_i}{n_0} \right)$
- (2) $\beta = \arcsin \left(\frac{\sin \theta_d}{n_0} \right)$
- (3) $\phi = \arcsin \left(\frac{\cos \beta - \cos \alpha}{\sqrt{2(1 + \sin \alpha \sin \beta \cos \phi_{skew} - \cos \alpha \cos \beta)}} \right) + 90$
- (4) $d = \sqrt{\frac{\lambda_a^2}{\sin^2 \theta_d \sin^2 \phi_{skew} + (\sin \theta_i + \sin \theta_d \cos \phi_{skew})^2}}$
- (5) $L = d \sin \phi$
- (6) $C_R = \cos \alpha$
- (7) $C_S = \cos \alpha - \frac{\lambda_a}{n_0 L} \cos \phi$
- (8) $N = \pi n_1 \frac{T}{\lambda_a \sqrt{C_R C_S}}$
- (9) $\theta_{Ro} = \arcsin \left(\frac{d}{\lambda_a} \sin \theta_d \sin \phi_{skew} \right)$
- (10) $\Gamma = \frac{2\pi(\sin \alpha \sin \phi \cos \theta_{Ro} + \cos \alpha \cos \phi)}{L} - \frac{\pi \lambda_a}{n_0 L^2}$
- (11) $S = \Gamma \frac{T}{2C_S}$

FIG. 10C1



$$(12) \kappa = -\sin\alpha \sin\beta \cos\phi_{skew} + \cos\alpha \cos\beta$$

$$(13) E_{par} = \frac{\left(\sin\left(\sqrt{N^2 + S^2}\right) \right)^2}{1 + \frac{S^2}{N^2}}$$

$$(14) E_{perp} = \frac{\left(\sin\left(\sqrt{(N\kappa)^2 + S^2}\right) \right)^2}{1 + \frac{S^2}{(N\kappa)^2}}$$

$$(15) P_{par} = \frac{-\sin\phi \sin\theta_{Ro}}{\sin(\arccos(-\sin\alpha \sin\phi \cos + \cos\alpha \cos\phi))}$$

$$(16) P_{perp} = 1 - P_{par}$$

Diffraction efficiencies E_s and E_p , given losses t_s and t_p which are specific to each polarization and include absorption, scattering, and reflection losses from AR coatings on the outer surfaces of the disc glass.

$$(17) E_s = (E_{perp}P_{par} + E_{par}P_{perp})t_s$$

$$(18) E_p = (E_{perp}P_{perp} + E_{par}P_{par})t_p$$

Total out-and-back efficiency is given by t_s , assuming no polarizer in front of the photodetector

$$(18) T_s = E_s \frac{E_s + E_p}{2}$$

FIG. 10C2



$$(20) \theta_d\{\theta_R\} = \arcsin \sqrt{\left(\frac{\lambda_a}{d}\right)^2 - 2 \frac{\lambda_a}{d} \cos\theta_R \sin\theta_i + \sin^2\theta_i}$$

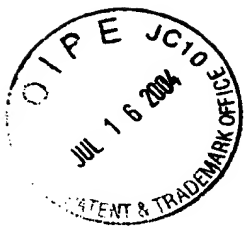
$$(21) \phi_{skew}\{\theta_R\} = \arctan \left[\frac{\sin\theta_R}{\cos\theta_R - (d/\lambda_a)\sin\theta_i} \right]$$

$$(22) T_s\{\theta_{imax}\}\cos\theta_d|_{\theta_R = \theta_{Ro} - \frac{1}{2}\theta_{ROTi}} = T_s\{\theta_{imax}\}\cos\theta_d|_{\theta_R = \theta_{Ro} - \frac{1}{2}\theta_{ROTi}}$$

The design efficiency of the i-th facet is given by evaluating T_s at the design incidence angle, θ_i , the design rotation angle, θ_{Ro} , and the index modulation that maximizes the efficiency, n_{imax} , given the true maximum efficiency incidence angle, θ_{imax} , that results from equation (22). The relative efficiency, H_i , is then given by dividing the total efficiency of the first facet by that of the i-th facet.

$$(23) H_i = \frac{T_{s1}}{T_{si}\{\theta_i, \theta_{imax}, \theta_{Ro}, n_{imax}\}}$$

FIG. 10C3



Diffraction Efficiency Variation with Disc Rotation

Facet 1: before optimization

Fixed design parameters:

$$\theta_i = 38^\circ$$

$$\theta_d = 52^\circ$$

$$\phi_{skew} = 0^\circ$$

$$\lambda_a = 650 \text{ nm}$$

DCG parameters:

$$T = 2.5 \text{ microns}$$

$$n_0 = 1.40$$

$$n_1 = 0.121$$

Relative signal is equal to $T_s \cos \theta_d$. Note that the relative signal falls off as the rotation angle goes away from zero. This is for a maximum efficiency incidence angle, θ_{imax} , equal to θ_i (38°). This indicates a non-optimum configuration.

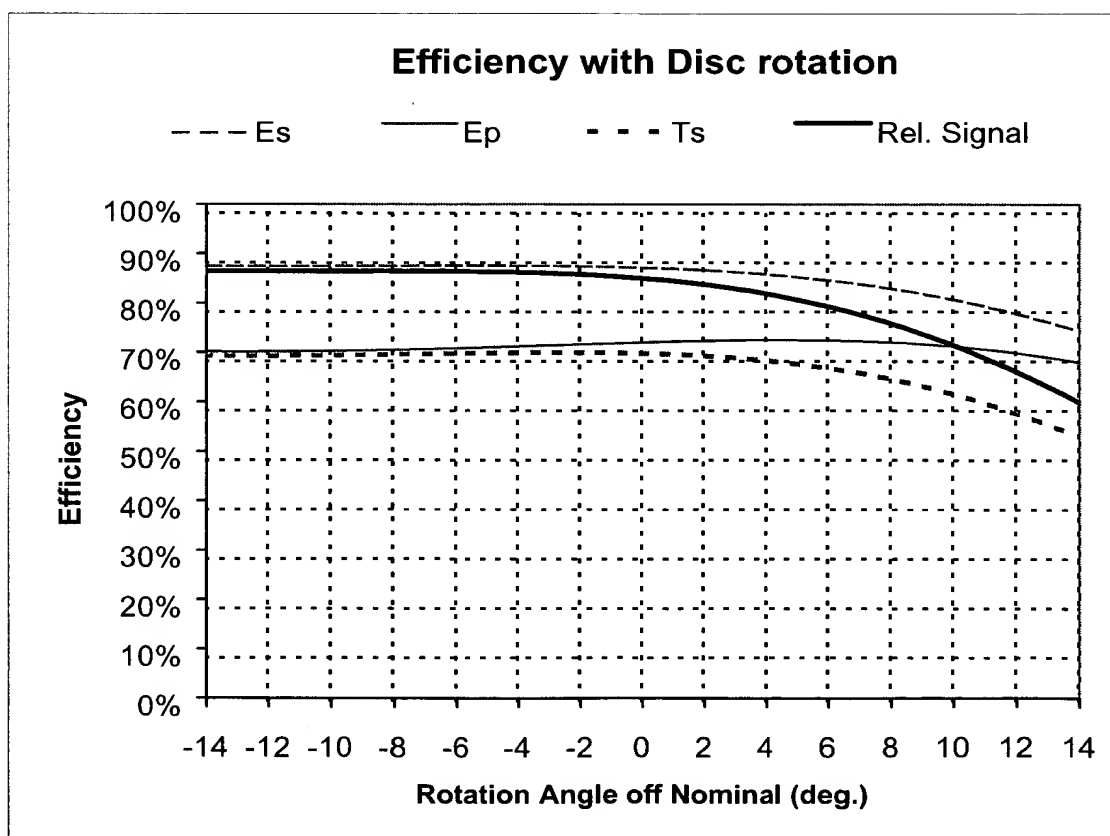
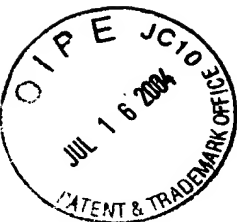


FIG. 10D1



Diffraction Efficiency Variation with Disc Rotation

Facet 1: after optimization

Fixed design parameters:
 $\theta_i = 38^\circ$ $\theta_d = 52^\circ$ $\phi_{skew} = 0^\circ$ $\lambda_a = 650 \text{ nm}$

DCG parameters:
 $T = 2.5 \text{ microns}$ $n_0 = 1.40$ $n_1 = 0.121$

Relative signal is equal to $T_s \cos \theta_d$. Note that the relative signal at a rotation angle of $\pm 13^\circ$ is equal to the relative signal at 0° . This is achieved when the maximum efficiency incidence angle, θ_{imax} , is 36.3° .

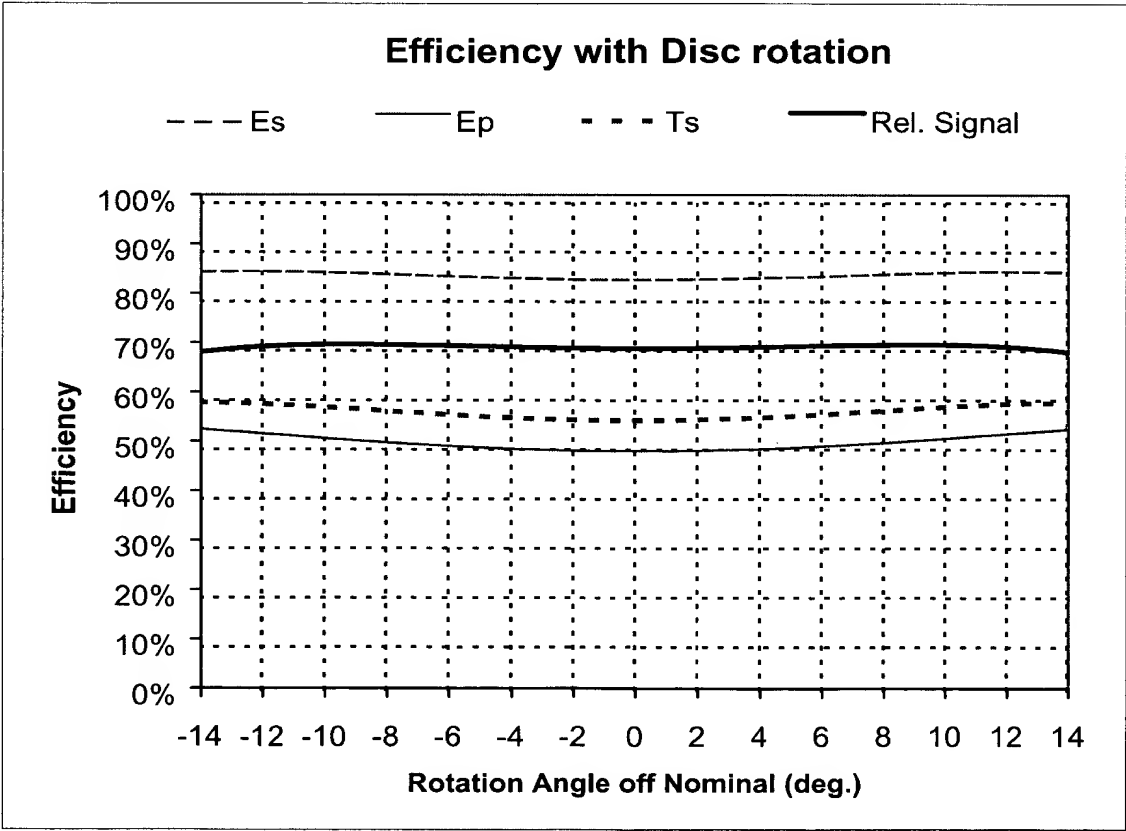
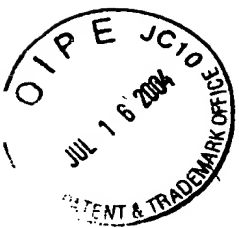


FIG. 10D2



Diffraction Efficiency Variation with Disc Rotation

Facet 7: before optimization

Fixed design parameters:

$$\theta_i = 38^\circ$$

$$\theta_d = 32^\circ$$

$$\phi_{skew} = 28^\circ$$

$$\lambda_a = 650 \text{ nm}$$

DCG parameters:

$$T = 2.5 \text{ microns}$$

$$n_0 = 1.40$$

$$n_1 = 0.121$$

Relative signal is equal to $T_s \cos \theta_d$. Note that the relative signal falls off as the rotation angle goes from negative to positive. This is for a maximum efficiency incidence angle, θ_{imax} , equal to θ_i (38°). This indicates a non-optimum configuration.

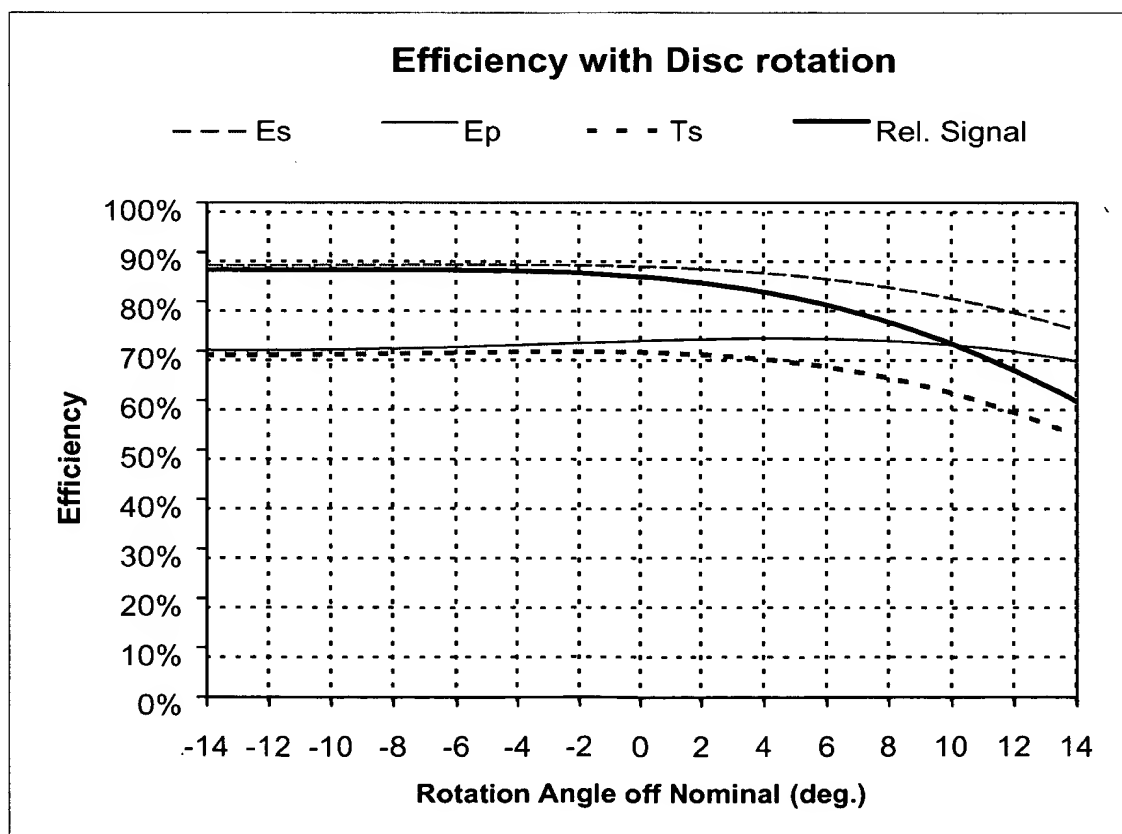


FIG. 10E1



Diffraction Efficiency Variation with Disc Rotation

Facet 7: after optimization

Fixed design parameters:

$$\theta_i = 38^\circ$$

$$\theta_d = 32^\circ$$

$$\phi_{skew} = 28^\circ$$

$$\lambda_a = 650 \text{ nm}$$

DCG parameters:

$$T = 2.5 \text{ microns}$$

$$n_0 = 1.40$$

$$n_1 = 0.121$$

Relative signal is equal to $T_s \cos \theta_d$. Note that the relative signal at a rotation angle of -14° is equal to the relative signal at $+14^\circ$. This is achieved when the maximum efficiency incidence angle, θ_{imax} , is 35.8° .

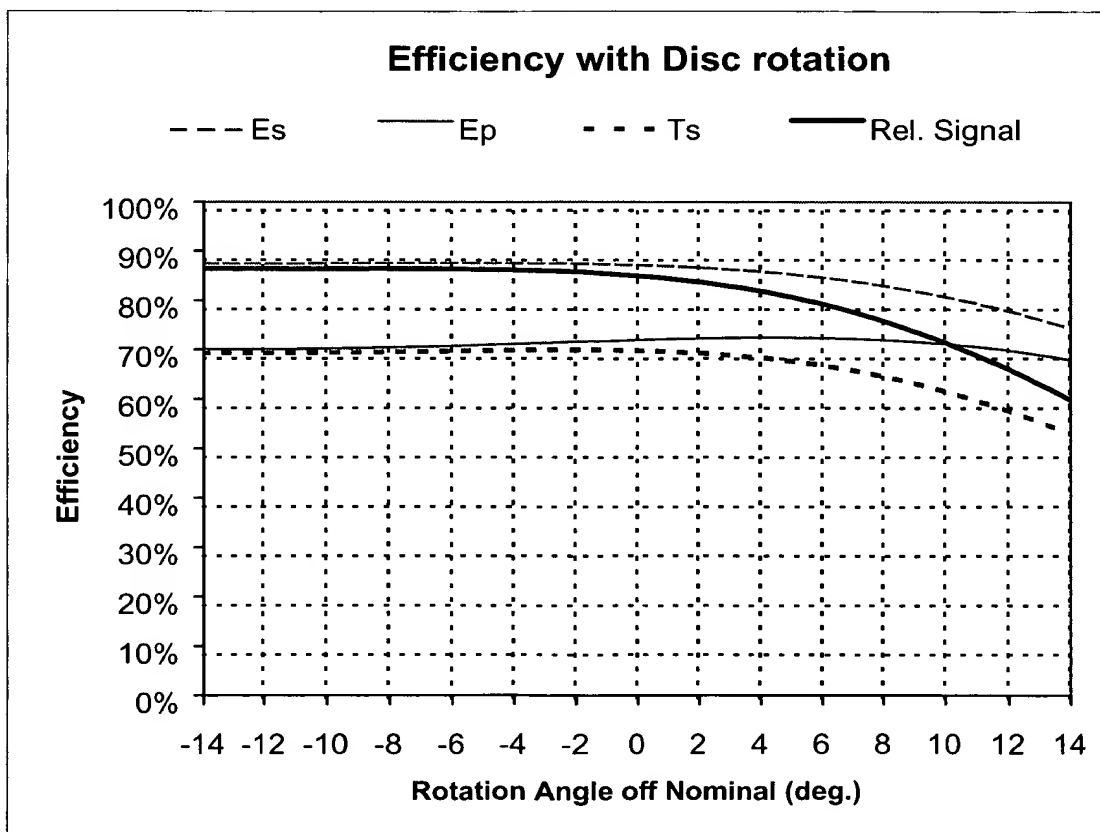
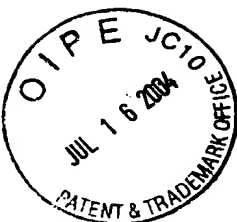


FIG. 10E2



S and P Diffraction Efficiency Calculations

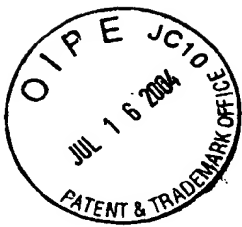
It is assumed that there is no deviation from the nominal wavelength.

Facet-independent design parameters:

- Design wavelength: 650 nm
- External incidence angle: 38 deg
- Internal incidence angle: 26.09 deg
- Geletin effective thickness: 2.5 microns
- Average bulk refractive index: 1.4
- Refractive index modulation: 0.121
- S-polarization losses: 10%
- P-polarization losses: 10%
- degrees to radians conversion: 0.017453

Facet	θ_d (deg.)	β (deg.)	ϕ_{skew} (deg.)	d (nm)	θ_{Ro} (deg.)	θ_{jmax} (deg.)	α_{max} (deg.)	β_{max} (deg.)	ϕ_{smax} (deg.)	ϕ (deg.)	L (nm)	θ_{ROT} (deg.)
1	52.00	34.25	0	463.1	0.00	36.30	25.02	35.43	0.00	84.79	461.2	26.24
2	50.00	33.17	0	470.4	0.00	36.30	25.02	34.34	0.00	85.34	468.9	28.35
3	48.00	32.06	0	478.4	0.00	36.30	25.02	33.21	0.00	85.90	477.1	26.66
4	46.00	30.92	0	486.9	0.00	36.30	25.02	32.05	0.00	86.48	486.0	29.19
5	42.00	28.55	0	505.9	0.00	36.30	25.02	29.66	0.00	87.68	505.5	27.97
6	38.00	26.09	0	527.9	0.00	36.30	25.02	27.17	0.00	88.92	527.8	30.28
7	32.00	22.24	28	584.7	12.93	35.80	24.70	23.45	26.52	90.64	584.6	27.99
8	32.00	22.24	-28	584.7	-12.93	35.80	24.70	23.45	-26.52	90.64	584.6	27.99
9	30.00	20.92	28	600.2	12.52	35.56	24.55	22.26	26.27	91.17	600.1	30.65
10	30.00	20.92	-28	600.2	-12.52	35.56	24.55	22.26	-26.27	91.17	600.1	30.65
11	28.00	19.59	28	617.0	12.08	35.72	24.65	20.83	26.28	91.96	616.6	29.19
12	28.00	19.59	-28	617.0	-12.08	35.72	24.65	20.83	-26.28	91.96	616.6	29.19

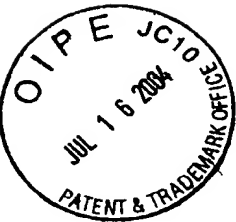
FIG. 10F1



C_R:
0.898

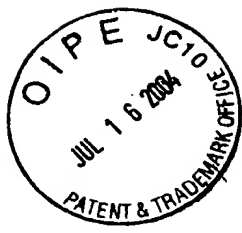
C _S	N	θ _d		β		φ _{skew}		Γ		S	
		-1/2θ _{ROT}	+1/2θ _{ROT}	-1/2θ _{ROT}	+1/2θ _{ROT}	-1/2θ _{ROT}	+1/2θ _{ROT}	-1/2θ _{ROT}	+1/2θ _{ROT}	-1/2θ _{ROT}	+1/2θ _{ROT}
0.807	1.718	54.70	54.70	35.66	35.66	-22.98	22.98	0.0634	0.2192	0.0982	0.3397
0.818	1.706	53.05	53.05	34.81	34.81	-25.05	25.05	0.0380	0.2168	0.0581	0.3315
0.829	1.695	50.61	50.61	33.51	33.51	-23.91	23.91	0.0586	0.2143	0.0885	0.3232
0.839	1.684	49.05	49.05	32.65	32.65	-26.45	26.45	0.0285	0.2116	0.0424	0.3150
0.861	1.663	44.69	44.69	30.16	30.16	-26.20	26.20	0.0438	0.2057	0.0636	0.2987
0.882	1.643	41.07	41.07	27.99	27.99	-29.30	29.30	0.0176	0.1992	0.0250	0.2825
0.907	1.620	29.76	38.91	20.76	26.66	-2.39	53.28	0.3498	0.2307	0.4820	0.3180
0.907	1.620	38.91	29.76	26.66	20.76	-53.28	2.39	-0.1618	0.2307	-0.2230	0.3180
0.914	1.614	27.96	37.62	19.57	25.85	-6.49	55.95	0.3549	0.2510	0.4854	0.3432
0.914	1.614	37.62	27.96	25.85	19.57	-55.95	6.49	-0.1726	0.2510	-0.2360	0.3432
0.924	1.605	26.06	35.04	18.29	24.21	-6.05	55.44	0.3252	0.2304	0.4400	0.3118
0.924	1.605	35.04	26.06	24.21	18.29	-55.44	6.05	-0.1470	0.2304	-0.1988	0.3118

FIG. 10F2



$\frac{1}{2}\theta_{ROT}$	K θ_{Ro}	E_{par} θ_{Ro}		E_{perp} θ_{Ro}		P_{par} θ_{Ro}		P_{perp} θ_{Ro}	
		$-\frac{1}{2}\theta_{ROT}$	$+\frac{1}{2}\theta_{ROT}$	$-\frac{1}{2}\theta_{ROT}$	$+\frac{1}{2}\theta_{ROT}$	$-\frac{1}{2}\theta_{ROT}$	$+\frac{1}{2}\theta_{ROT}$	$-\frac{1}{2}\theta_{ROT}$	$+\frac{1}{2}\theta_{ROT}$
.5028	0.4948	0.9746	0.9315	0.5746	0.5759	0.0580	0.0580	0.9420	0.9420
.5187	0.5111	0.9804	0.9369	0.5983	0.5983	0.0680	0.0680	0.9320	0.9320
.5354	0.5277	0.9814	0.9420	0.6192	0.6192	0.0609	0.0609	0.9391	0.9391
.5519	0.5445	0.9865	0.9468	0.6416	0.6416	0.0733	0.0733	0.9267	0.9267
.5860	0.5787	0.9899	0.9552	0.6834	0.6834	0.0688	0.0688	0.9312	0.9312
.6200	0.6132	0.9945	0.9623	0.7248	0.6947	0.0818	0.0818	0.9182	0.9182
.6918	0.6843	0.9056	0.9567	0.7442	0.7720	0.0004	0.2446	0.9996	0.7554
.6906	0.6843	0.9773	0.9567	0.7946	0.7720	0.2446	0.0004	0.9380	0.9996
.7080	0.7002	0.9051	0.9508	0.7584	0.7833	0.0030	0.0587	0.9413	0.7386
.7068	0.7002	0.9755	0.9508	0.8093	0.7833	0.2614	0.0587	0.9413	0.9970
.7227	0.7159	0.9220	0.9597	0.7823	0.8032	0.0025	0.0555	0.9975	0.7548
.7221	0.7159	0.9828	0.9597	0.8276	0.8276	0.2452	0.0025	0.9445	0.9975

FIG. 10F3



E_s θ_{Ro}		$+1/2\theta_{ROT}$		E_p θ_{Ro}		T_s θ_{Ro}		H_i		Solver (=0)
$-1/2\theta_{ROT}$		$-1/2\theta_{ROT}$		$-1/2\theta_{ROT}$		$-1/2\theta_{ROT}$		$-1/2\theta_{ROT}$		
85.6%	83.8%	85.6%	53.9%	48.8%	53.9%	59.7%	55.6%	59.7%	1.000	0
85.9%	84.3%	85.9%	56.2%	50.8%	56.2%	61.0%	57.0%	61.0%	0.976	0
86.3%	84.8%	86.3%	57.7%	52.7%	57.7%	62.2%	58.3%	62.2%	0.953	0
86.5%	85.2%	86.5%	60.0%	54.7%	60.0%	63.4%	59.6%	63.4%	0.932	0
87.2%	86.0%	87.2%	63.4%	58.7%	63.4%	65.7%	62.2%	65.7%	0.894	0
87.5%	86.6%	87.5%	67.2%	62.5%	67.2%	67.7%	64.6%	67.7%	0.861	0
81.5%	85.1%	83.9%	67.0%	70.5%	75.5%	60.5%	66.2%	66.9%	0.840	0.020396813
83.9%	85.1%	81.5%	75.5%	70.5%	67.0%	66.9%	66.2%	60.5%	0.840	0.020396813
81.4%	84.7%	83.9%	68.3%	71.4%	76.7%	60.9%	66.1%	67.4%	0.841	0.02187036
83.9%	84.7%	81.4%	76.7%	71.4%	68.3%	67.4%	66.1%	60.9%	0.841	0.02187036
82.9%	85.6%	85.0%	70.4%	73.1%	77.9%	63.6%	67.9%	69.3%	0.819	0.019325482
85.0%	85.6%	82.9%	77.9%	73.1%	70.4%	69.3%	67.9%	63.6%	0.819	0.019325482
										0.255193744

FIG. 10F4

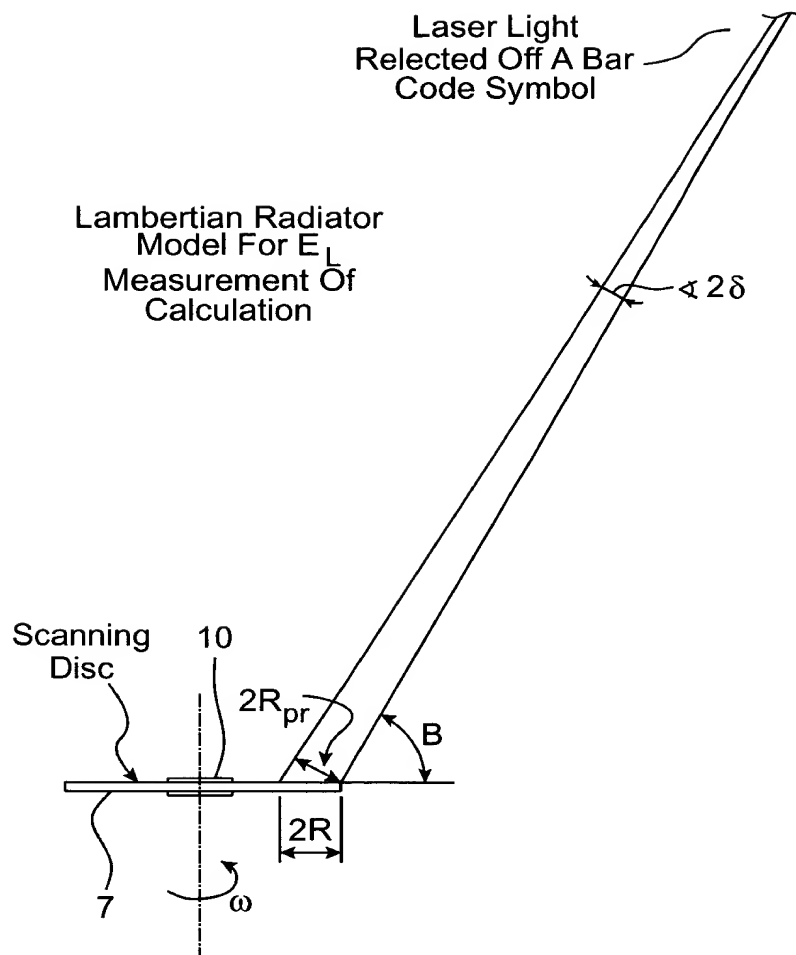
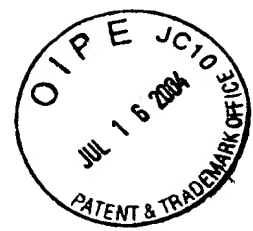


FIG. 10G1



FACET LIGHT COLLECTION EFFICIENCY

- Z = DISTANCE FROM SCAN POINT ON LABEL (MAX = FOCAL)
LENGTH PLUS 5 INCHES
- Area = AREA OF CORRESPONDING FACET
- R = RADIUS OF EFFECTIVE CIRCULAR APERTURE
- R.pr = RADIUS OF PROJECTED EFFECTIVE CIRCULAR APERTURE
- B = ANGLE BETWEEN OUTGOING BEAM AND THE DISC
- δ = HALF-ANGLE SUBTENDED BY EFFECTIVE PROJECTED
CIRCULAR APERTURE
- E.L = LAMBERTIAN LIGHT COLLECTION EFFICIENCY

FIG. 10G2

$$R_{pr} := \sqrt{\frac{\text{Area} \sin B}{\pi}}$$

$$\delta := \text{atan}\left[\frac{R_{pr}}{Z}\right]$$

$$E_L := (\sin(\delta))^2$$

FIG. 10G3

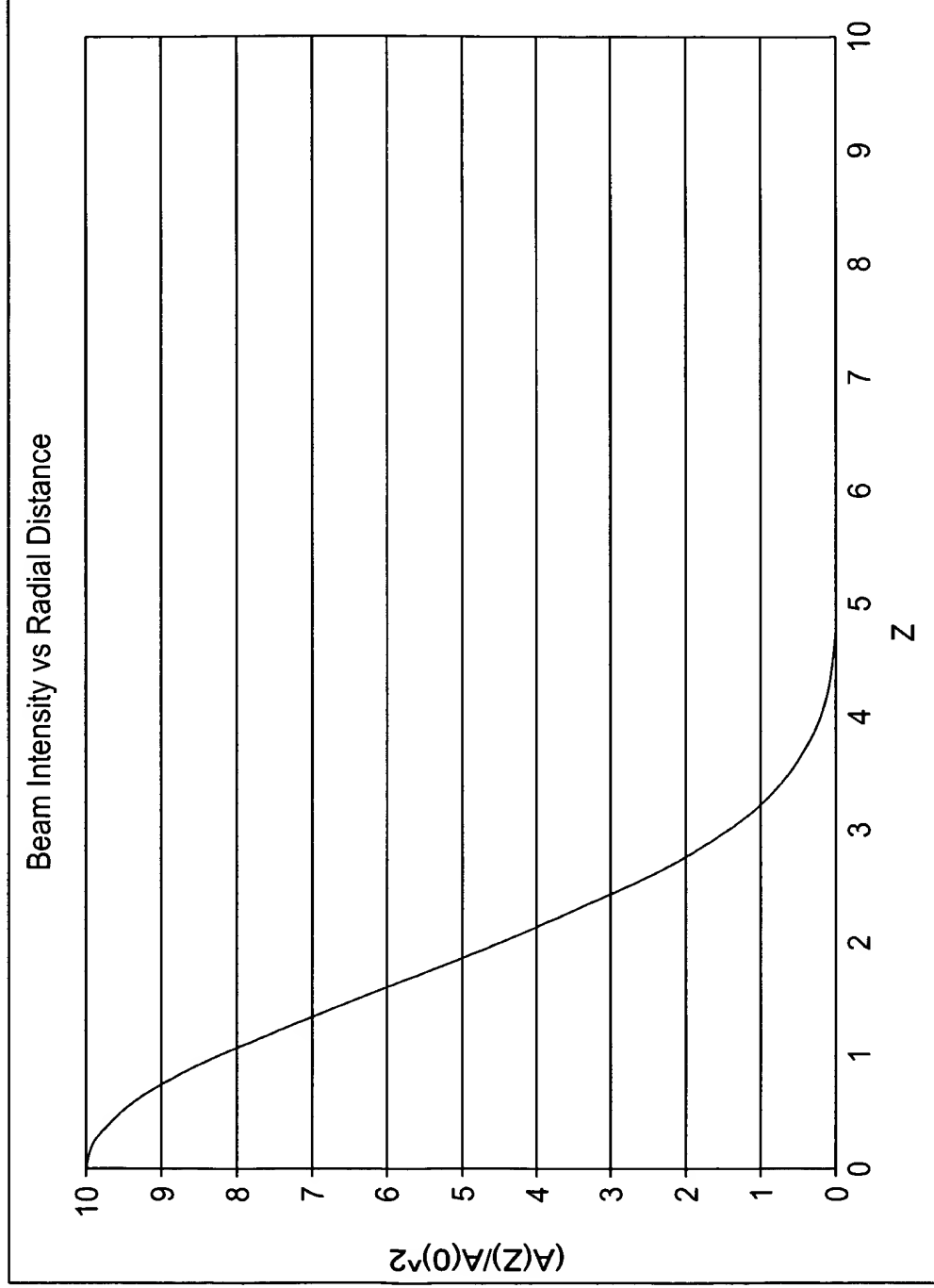
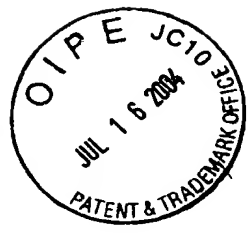
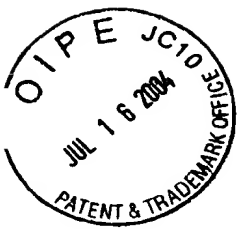


FIG. 11A2



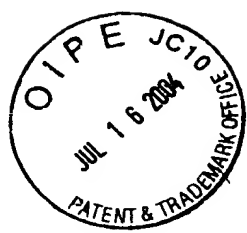
	A	B	C	D	E	F	G	H	I	J	K	L
1	Gaussian beam analysis for a multi-focal-plane scanner GausStratos_4.xls											
2							Pi:	3.1415927				
3	Beam diameter as a function of the distance from the focusing holographic facet											
4												
5												
6	Wavelength (nm):		650	(Linked from Disk spreadsheet)								
7												
8	Beam diameter											
9	at the facet (mm):		1.31	(Linked from Trunc spreadsheet)								
10												
11	P2:		0.505384	60%	Resolution criterion (% of peak intensity)							
12	(P2 is the ratio of the		60%	intensity diameter to the 1/e-squared diameter)								
13												
14	Rayleigh range (in.):		82									
15												
16	Total number of focal planes:			4	<--- Do not enter a value here. Entered automatically.							
17	(See note at cell A196)			Enter values in the row below.								
18	Focal plane:			1	2	3	4					
19												
20	Waist location (Zmin):			11.5	13.5	15.6	17.7					
21	(inches)	Rot. Angle:	26.24			Volts==>		5.42	9.3	<==Overall DOF		
22	Geom. focal length:			11.7	13.9	16.2	18.6					
23	(inches)											
24	Total facet angular sweep (degrees):				358.14	(Linked from Disk spreadsheet)						
25	Beam diameter			7.40	8.76	10.22	11.74					
26	at focal point (mils)											
27	(1/e-squared)											
28												
29	Required resolution (mils)				7.5							
30	(Minimum bar width - X)											
31												
32	Distance from disk			Half power beam diameters (in mils) for each scan line								
33	(inches)											
34				1	2	3	4					
35												

FIG. 11B1A



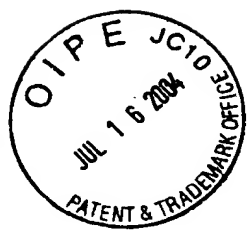
	M	N	O	P	Q	R	S	T	U	V	W	X
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20							11.85					
21												
22							12.1					
23												
24												
25							7.63					
26												
27												
28												
29												
30												
31												
32												
33							Facet 2			Measured values		
34									zero deg.	7.5 deg. CCW	7.5 deg. CW	
35												

FIG. 11B1B



	A	B	C	D	E	F	G	H	I	J	K	L
36	8		8.70	11.36	13.47	15.11						
37	8.1		8.49	11.19	13.32	14.98						
38	8.2		8.29	11.01	13.17	14.84						
39	8.3		8.09	10.84	13.02	14.71						
40	8.4		7.89	10.66	12.87	14.58						
41	8.5		7.69	10.49	12.71	14.45						
42	8.6		7.50	10.31	12.56	14.31						
43	8.7		7.30	10.14	12.41	14.18						
44	8.8		7.11	9.97	12.26	14.05						
45	8.9		6.92	9.80	12.11	13.92						
46	9		6.73	9.63	11.97	13.79						
47	9.1		6.54	9.46	11.82	13.66						
48	9.2		6.36	9.29	11.67	13.53						
49	9.3		6.18	9.12	11.52	13.40						
50	9.4		6.00	8.96	11.37	13.27						
51	9.5		5.82	8.79	11.23	13.14						
52	9.6		5.65	8.62	11.08	13.01						
53	9.7		5.48	8.46	10.93	12.88						
54	9.8		5.32	8.30	10.79	12.75						
55	9.9		5.16	8.14	10.64	12.63						
56	10		5.01	7.98	10.50	12.50						
57	10.1		4.86	7.82	10.36	12.37						
58	10.2		4.72	7.66	10.21	12.24						
59	10.3		4.58	7.50	10.07	12.12						
60	10.4		4.45	7.35	9.93	11.99						
61	10.5		4.33	7.20	9.79	11.87						
62	10.6		4.22	7.05	9.65	11.74						
63	10.7		4.12	6.90	9.51	11.61						
64	10.8		4.02	6.75	9.37	11.49						
65	10.9		3.94	6.61	9.23	11.37						
66	11		3.87	6.46	9.10	11.24						
67	11.1		3.81	6.32	8.96	11.12						
68	11.2		3.76	6.19	8.83	11.00						
69	11.3		3.73	6.05	8.69	10.87						
70	11.4		3.71	5.92	8.56	10.75						

FIG. 11B1C



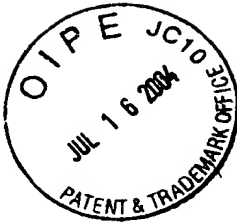
	M	N	O	P	Q	R	S	T	U	V	W	X
36	221	289	342	384 #VALUE!			9.22	234				
37	216	284	338	380 #VALUE!			9.02	229				
38	211	280	334	377 #VALUE!			8.83	224				
39	206	275	331	374 #VALUE!			8.63	219				
40	200	271	327	370 #VALUE!			8.44	214				
41	195	266	323	367 #VALUE!			8.24	209				
42	190	262	319	364 #VALUE!			8.05	204				
43	185	258	315	360 #VALUE!			7.86	200				
44	181	253	312	357 #VALUE!			7.67	195				
45	176	249	308	354 #VALUE!			7.48	190				
46	171	245	304	350 #VALUE!			7.29	185				
47	166	240	300	347 #VALUE!			7.11	181				
48	162	236	296	344 #VALUE!			6.92	176				
49	157	232	293	340 #VALUE!			6.74	171				
50	152	227	289	337 #VALUE!			6.57	167				
51	148	223	285	334 #VALUE!			6.39	162		200	200	
52	144	219	281	330 #VALUE!			6.22	158				
53	139	215	278	327 #VALUE!			6.05	154				
54	135	211	274	324 #VALUE!			5.88	149				
55	131	207	270	321 #VALUE!			5.71	145				
56	127	203	267	317 #VALUE!			5.55	141				
57	123	199	263	314 #VALUE!			5.40	137				
58	120	195	259	311 #VALUE!			5.25	133				
59	116	191	256	308 #VALUE!			5.10	129				
60	113	187	252	305 #VALUE!			4.96	126				
61	110	183	249	301 #VALUE!			4.82	122				
62	107	179	245	298 #VALUE!			4.69	119				
63	105	175	242	295 #VALUE!			4.57	116				
64	102	171	238	292 #VALUE!			4.45	113				
65	100	168	235	289 #VALUE!			4.34	110				
66	98	164	231	286 #VALUE!			4.24	108		185	144	
67	97	161	228	282 #VALUE!			4.15	105				
68	96	157	224	279 #VALUE!			4.07	103				
69	95	154	221	276 #VALUE!			4.00	102				

FIG. 11B1D



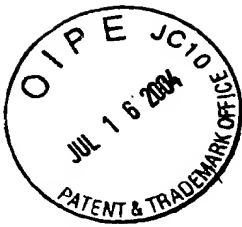
	A	B	C	D	E	F	G	H	I	J	K
70	11.4		3.71	5.92	8.56	10.75					
71	11.5		3.70	5.80	8.43	10.63					
72	11.6		3.71	5.67	8.30	10.51					
73	11.7		3.73	5.55	8.17	10.39					
74	11.8		3.76	5.44	8.04	10.27					
75	11.9		3.81	5.32	7.91	10.15					
76	12		3.87	5.22	7.79	10.04					
77	12.1		3.94	5.12	7.66	9.92					
78	12.2		4.02	5.02	7.54	9.80					
79	12.3		4.12	4.93	7.42	9.69					
80	12.4		4.22	4.84	7.30	9.57					
81	12.5		4.33	4.76	7.18	9.46					
82	12.6		4.45	4.69	7.07	9.34					
83	12.7		4.58	4.62	6.95	9.23					
84	12.8		4.72	4.56	6.84	9.12					
85	12.9		4.86	4.51	6.73	9.01					
86	13		5.01	4.47	6.63	8.90					
87	13.1		5.16	4.43	6.52	8.79					
88	13.2		5.32	4.40	6.42	8.68					
89	13.3		5.48	4.38	6.32	8.58					
90	13.4		5.65	4.37	6.22	8.47					
91	13.5		5.82	4.36	6.13	8.36					
92	13.6		6.00	4.37	6.04	8.26					
93	13.7		6.18	4.38	5.95	8.16					
94	13.8		6.36	4.40	5.87	8.06					
95	13.9		6.54	4.43	5.79	7.96					
96	14		6.73	4.47	5.71	7.86					
97	14.1		6.92	4.51	5.63	7.76					
98	14.2		7.11	4.56	5.56	7.67					
99	14.3		7.30	4.62	5.50	7.58					
100	14.4		7.50	4.69	5.44	7.48					

FIG. 11B1E



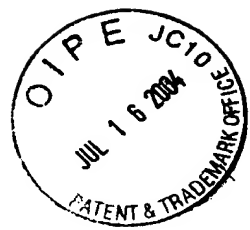
	L	M	N	O	P	Q	R	S	T	U	V	W	X
70		94	150	217	273	#VALUE!		3.94	100				
71		94	147	214	270	#VALUE!		3.89	99				
72		94	144	211	267	#VALUE!		3.86	98				
73		95	141	207	264	#VALUE!		3.83	97				
74		96	138	204	261	#VALUE!		3.82	97				
75		97	135	201	258	#VALUE!		3.82	97				
76		98	133	198	255	#VALUE!		3.83	97		185	143	
77		100	130	195	252	#VALUE!		3.86	98				
78		102	127	192	249	#VALUE!		3.89	99				
79		105	125	188	246	#VALUE!		3.94	100				
80		107	123	185	243	#VALUE!		4.00	102				
81		110	121	182	240	#VALUE!		4.07	103				
82		113	119	180	237	#VALUE!		4.15	105				
83		116	117	177	234	#VALUE!		4.24	108				
84		120	116	174	232	#VALUE!		4.34	110				
85		123	115	171	229	#VALUE!		4.45	113				
86		127	113	168	226	#VALUE!		4.57	116		194	149	
87		131	113	166	223	#VALUE!		4.69	119				
88		135	112	163	221	#VALUE!		4.82	122				
89		139	111	161	218	#VALUE!		4.96	126				
90		144	111	158	215	#VALUE!		5.10	129				
91		148	111	156	212	#VALUE!		5.25	133				
92		152	111	153	210	#VALUE!		5.40	137				
93		157	111	151	207	#VALUE!		5.55	141				
94		162	112	149	205	#VALUE!		5.71	145				
95		166	113	147	202	#VALUE!		5.88	149				
96		171	113	145	200	#VALUE!		6.05	154		200	162	
97		176	115	143	197	#VALUE!		6.22	158				
98		181	116	141	195	#VALUE!		6.39	162				
99		185	117	140	192	#VALUE!		6.57	167				
100		190	119	138	190	#VALUE!		6.74	171				

FIG. 11B1F



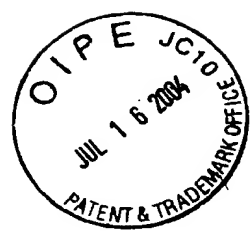
	A	B	C	D	E	F	G	H	I	J	K	L
101	14.5		7.69	4.76	5.38	7.39						
102	14.6		7.89	4.84	5.33	7.30						
103	14.7		8.09	4.93	5.28	7.22						
104	14.8		8.29	5.02	5.23	7.13						
105	14.9		8.49	5.12	5.20	7.05						
106	15		8.70	5.22	5.16	6.97						
107	15.1		8.90	5.32	5.13	6.89						
108	15.2		9.10	5.44	5.11	6.81						
109	15.3		9.31	5.55	5.09	6.74						
110	15.4		9.52	5.67	5.08	6.66						
111	15.5		9.72	5.80	5.07	6.59						
112	15.6		9.93	5.92	5.07	6.53						
113	15.7		10.14	6.05	5.07	6.46						
114	15.8		10.35	6.19	5.08	6.40						

FIG. 11B1G



	M	N	O	P	Q	R	S	T	U	V	W	X
101	195	121	137	188	#VALUE!		6.92	176				
102	200	123	135	186	#VALUE!		7.11	181				
103	206	125	134	183	#VALUE!		7.29	185				
104	211	127	133	181	#VALUE!		7.48	190				
105	216	130	132	179	#VALUE!		7.67	195				
106	221	133	131	177	#VALUE!		7.86	200		178	178	
107	226	135	130	175	#VALUE!		8.05	204				
108	231	138	130	173	#VALUE!		8.24	209				
109	236	141	129	171	#VALUE!		8.44	214				
110	242	144	129	169	#VALUE!		8.63	219				
111	247	147	129	167	#VALUE!		8.83	224				
112	252	150	129	166	#VALUE!		9.02	229				
113	258	154	129	164	#VALUE!		9.22	234				
114	263	157	129	162	#VALUE!		9.42	239				

FIG. 11B1H



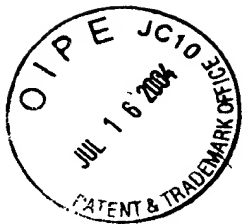
	A	B	C	D	E	F	G	H	I	J	K	L
115	15.9		10.56	6.32	5.09	6.34						
116	16		10.77	6.46	5.11	6.28						
117	16.1		10.98	6.61	5.13	6.22						
118	16.2		11.20	6.75	5.16	6.17						
119	16.3		11.41	6.90	5.20	6.12						
120	16.4		11.62	7.05	5.23	6.08						
121	16.5		11.83	7.20	5.28	6.04						
122	16.6		12.05	7.35	5.33	6.00						
123	16.7		12.26	7.50	5.38	5.96						
124	16.8		12.48	7.66	5.44	5.93						
125	16.9		12.69	7.82	5.50	5.90						
126	17		12.91	7.98	5.56	5.87						
127	17.1		13.12	8.14	5.63	5.85						
128	17.2		13.34	8.30	5.71	5.83						
129	17.3		13.55	8.46	5.79	5.81						
130	17.4		13.77	8.62	5.87	5.80						
131	17.5		13.99	8.79	5.95	5.79						
132	17.6		14.20	8.96	6.04	5.79						
133	17.7		14.42	9.12	6.13	5.78						
134	17.8		14.64	9.29	6.22	5.79						
135	17.9		14.86	9.46	6.32	5.79						
136	18		15.07	9.63	6.42	5.80						
137	18.1		15.29	9.80	6.52	5.81						
138	18.2		15.51	9.97	6.63	5.83						
139	18.3		15.73	10.14	6.73	5.85						
140	18.4		15.95	10.31	6.84	5.87						
141	18.5		16.17	10.49	6.95	5.90						
142	18.6		16.39	10.66	7.07	5.93						
143	18.7		16.60	10.84	7.18	5.96						
144	18.8		16.82	11.01	7.30	6.00						
145	18.9		17.04	11.19	7.42	6.04						
146	19		17.26	11.36	7.54	6.08						
147	19.1		17.48	11.54	7.66	6.12						
148	19.2		17.70	11.72	7.79	6.17						
149	19.3		17.92	11.89	7.91	6.22						
150	19.4		18.14	12.07	8.04	6.28						

FIG. 11B2A



	M	N	O	P	Q	R	S	T	U	V	W	X
115	268	161	129	161	#VALUE!		9.62	244				
116	274	164	130	160	#VALUE!		9.82	249		199	199	
117	279	168	130	158	#VALUE!		10.02	255				
118	284	171	131	157	#VALUE!		10.22	260				
119	290	175	132	156	#VALUE!		10.43	265				
120	295	179	133	154	#VALUE!		10.63	270				
121	301	183	134	153	#VALUE!		10.83	275				
122	306	187	135	152	#VALUE!		11.04	280				
123	311	191	137	151	#VALUE!		11.24	286				
124	317	195	138	151	#VALUE!		11.45	291				
125	322	199	140	150	#VALUE!		11.65	296				
126	328	203	141	149	#VALUE!		11.86	301				
127	333	207	143	149	#VALUE!		12.07	306				
128	339	211	145	148	#VALUE!		12.27	312				
129	344	215	147	148	#VALUE!		12.48	317				
130	350	219	149	147	#VALUE!		12.69	322				
131	355	223	151	147	#VALUE!		12.90	328				
132	361	227	153	147	#VALUE!		13.11	333				
133	366	232	156	147	#VALUE!		13.31	338				
134	372	236	158	147	#VALUE!		13.52	343				
135	377	240	161	147	#VALUE!		13.73	349				
136	383	245	163	147	#VALUE!		13.94	354				
137	388	249	166	148	#VALUE!		14.15	359				
138	394	253	168	148	#VALUE!		14.36	365				
139	400	258	171	149	#VALUE!		14.57	370				
140	405	262	174	149	#VALUE!		14.78	375				
141	411	266	177	150	#VALUE!		14.99	381				
142	416	271	180	151	#VALUE!		15.20	386				
143	422	275	182	151	#VALUE!		15.42	392				
144	427	280	185	152	#VALUE!		15.63	397				
145	433	284	188	153	#VALUE!		15.84	402				
146	438	289	192	154	#VALUE!		16.05	408				
147	444	293	195	156	#VALUE!		16.26	413				
148	450	298	198	157	#VALUE!		16.47	418				
149	455	302	201	158	#VALUE!		16.69	424				
150	461	307	204	160	#VALUE!		16.90	429				

FIG. 11B2B



	A	B	C	D	E	F	G	H	I	J	K	L
151	19.5		18.36	12.25	8.17	6.34						
152	19.6		18.58	12.43	8.30	6.40						
153	19.7		18.80	12.61	8.43	6.46						
154	19.8		19.02	12.78	8.56	6.53						
155	19.9		19.24	12.96	8.69	6.59						
156	20		19.46	13.14	8.83	6.66						
157		Minima (mils):	3.70	4.36	5.07	5.79						
158		DOF (inches):	5.80	6.40	6.73	6.64						
159		Maximum Possible Total DOF with no overlap (inches):					25.57	16.57	Estimate of achievable overall DOF			
160								6.76 inches			(Maximum possible)	
161												
162												
163												
164												
165												
166												
167												
168												
169												
170												
171												
172												
173												
174												
175												
176												
177												
178												
179												
180												
181												
182											Max f.l. =	17.7
183	Focal distances (in.):			11.5	13.5	15.6	17.7	0				
184	Total facet angular sweep (degrees):				358.14	(Linked from Disk spreadsheet)						
185	Nominal length of scan lines (in.):				N/A							

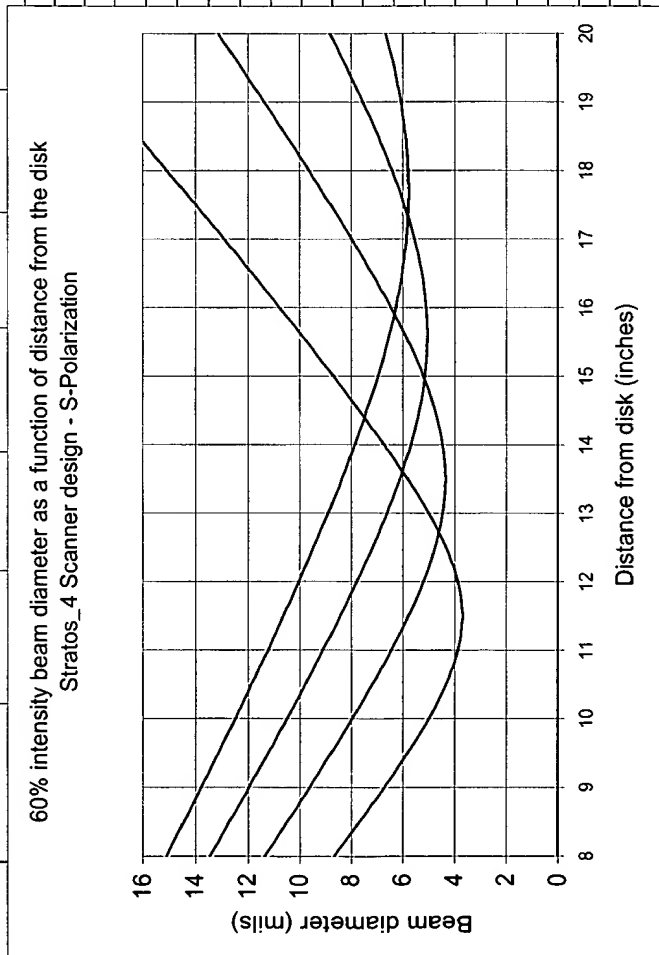
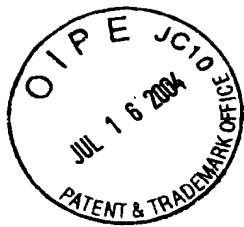


FIG. 11B2C



	M	N	O	P	Q	R	S	T	U	V	W	X
151	466	311	207	161 #VALUE!			17.11	435				
152	472	316	211	162 #VALUE!			17.32	440				
153	478	320	214	164 #VALUE!			17.54	445				
154	483	325	217	166 #VALUE!			17.75	451				
155	489	329	221	167 #VALUE!			17.96	456				
156	494	334	224	169 #VALUE!			18.18	462				
157												
158												
159												
160	single-focal-plane DOF											
161												
162												
163												
164												
165												
166												
167												
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181												
182												
183												
184												
185												

FIG. 11B2D



	A	B	C	D	E	F	G	H	I	J	K	L
186	Nominal scan width (in.):				N/A							
187	Read range (7 mil bars):	0.4	to		9.7							
188	(from scanner window)											
189	Scanner window = 10 inches from disk											
190	Overall depth of field (in.):				9.3							
191												
192	Signal				5.42 volts	(Linked from Disk spreadsheet)						
193	Bandwidth (MHz):				0.91 MHz	(Linked from Disk spreadsheet)						
194	Minimum signal				3.42 volts	(Linked from Disk spreadsheet)						
195												
196	Note: If the scan pattern is repeated N times per disk revolution, the focal distances should											
197	be repeated N times. This will result in filling the disk with a repeated facet layout.											
198												
199												
200												
201												
202												
203												
204												
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206												
207												
208												
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210												
211												
212												
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214												
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216												
217												
218												
219												
220												
221												

60% intensity beam diameter as a function of distance from the disk
Stratos_3 Scanner design - S-Polarization

Beam diameter (microns)

Distance from disk (inches)

FIG. 11B2E

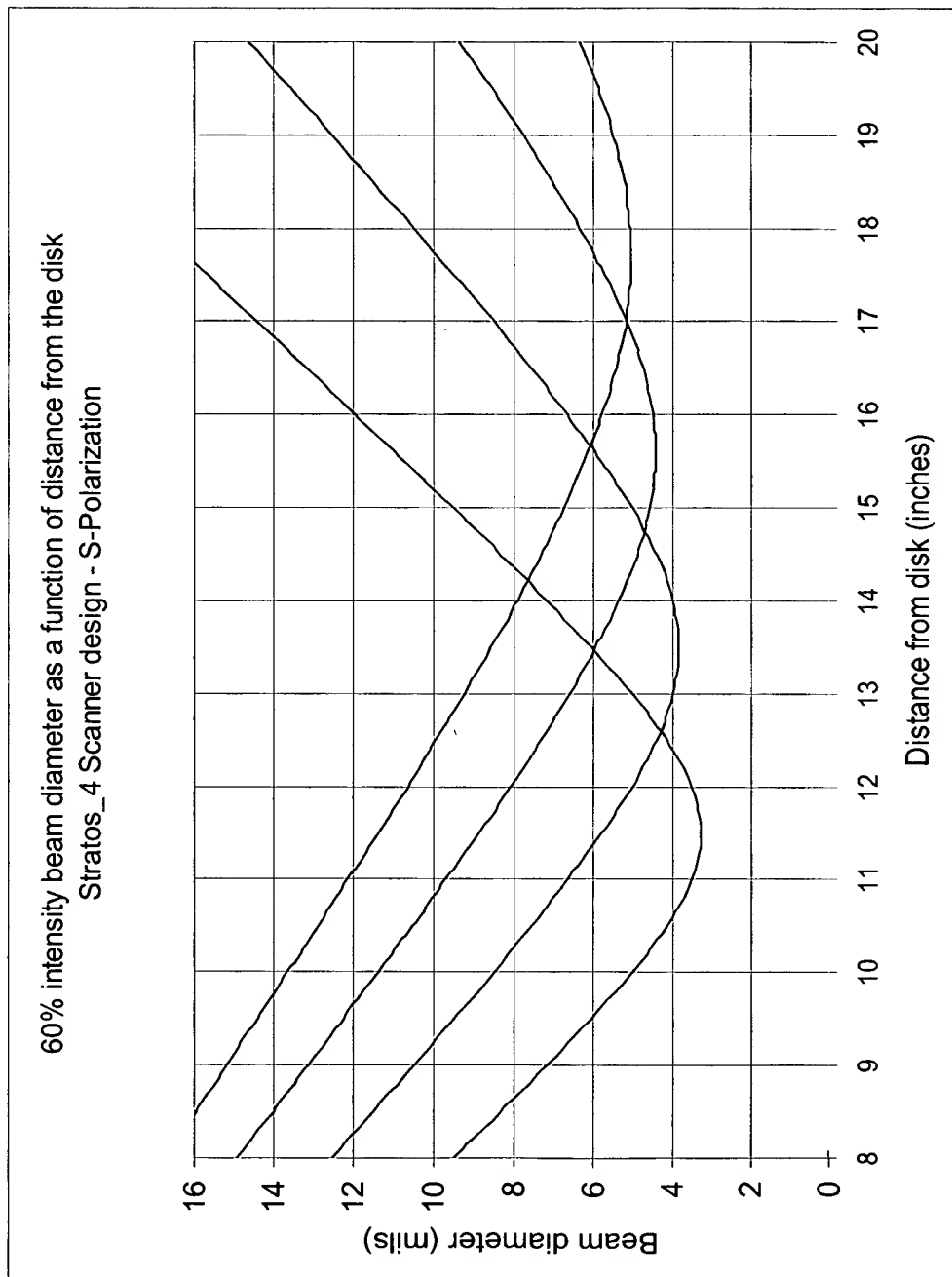
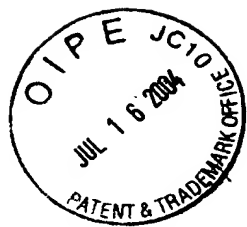


FIG. 11B3

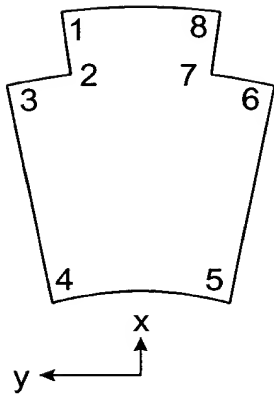


FIG. 12A1

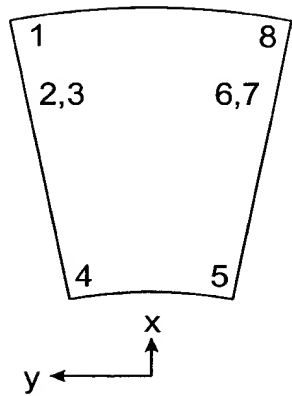


FIG. 12A2

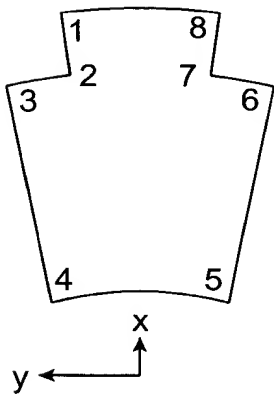


FIG. 12B1

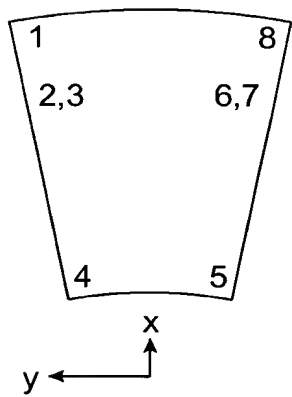
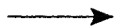


FIG. 12B2

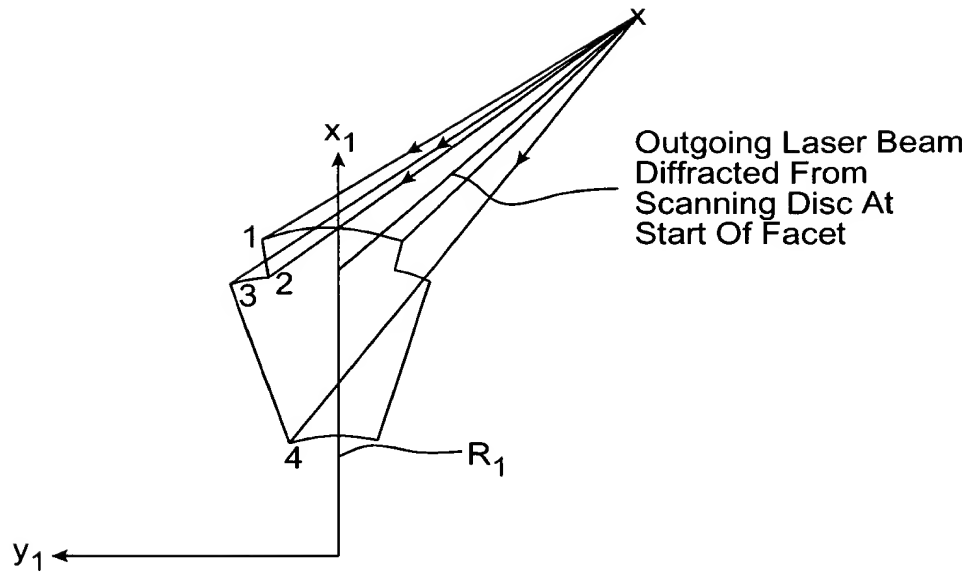
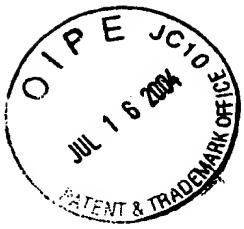


FIG. 12C1

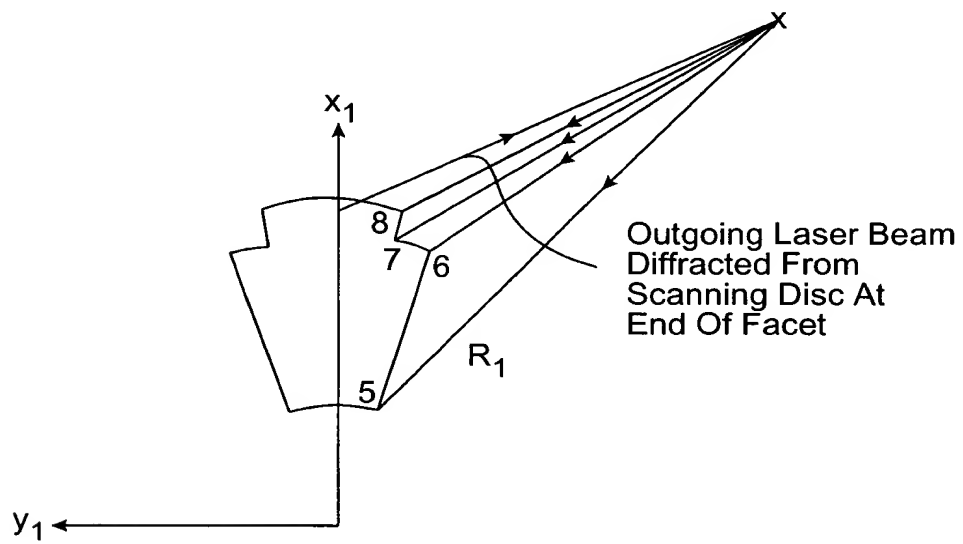


FIG. 12C2

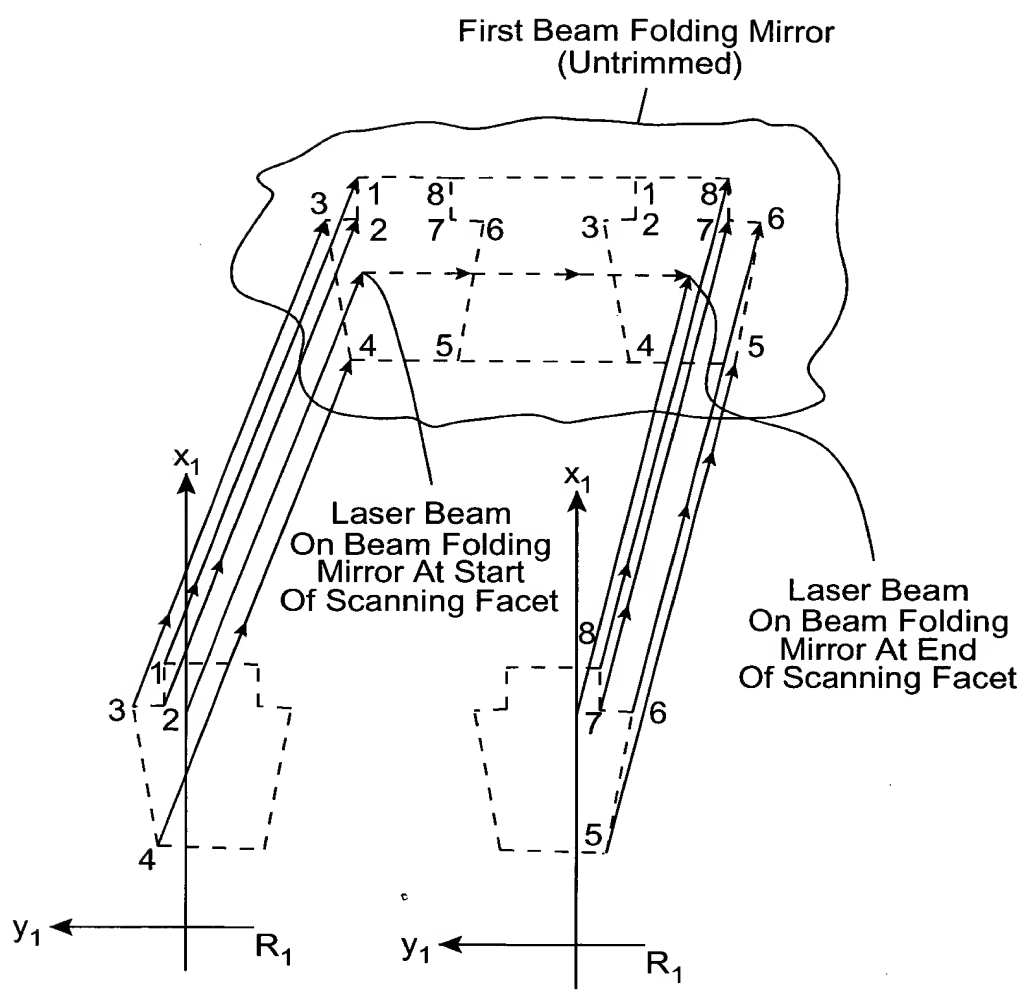
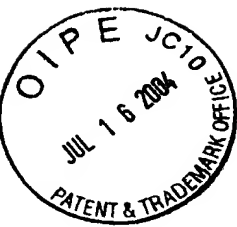
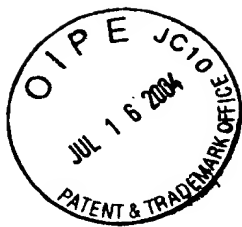
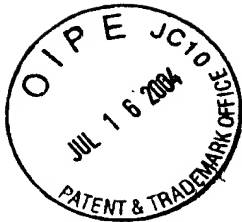


FIG. 12D



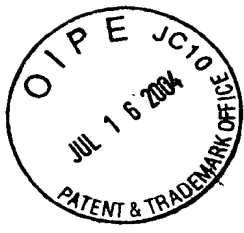
	A	B	C	D	E	F	G	H	I	J
75		1			2			3		
76		Facet			Facet			Facet		
77	G1	8			10			12		
78	Point 1	3.94874	-0.02294	2.12380	3.83250	0.07718	2.09937	3.75358	0.10925	2.09325
79	Point 2	3.65113	-0.12038	2.16443	3.53978	-0.02665	2.14166	3.45010	0.00887	2.13498
80	Point 3	3.61581	-0.03502	2.14098	3.53978	-0.02665	2.14166	3.44555	0.02059	2.13175
81	Point 4	2.64691	-0.40575	2.28887	2.88384	-0.25930	2.23643	2.44051	-0.31915	2.27208
82	Point 5	2.79472	-1.59304	2.62907	3.02644	-1.72489	2.65801	2.54066	-1.56107	2.63017
83	Point 6	3.81419	-2.04371	2.71867	3.69455	-2.02106	2.71697	3.56179	-2.02254	2.72286
84	Point 7	3.82907	-1.96478	2.69504	3.69455	-2.02106	2.71697	3.56439	-2.01174	2.71960
85	Point 8	4.13065	-2.08452	2.71758	3.98553	-2.15005	2.74265	3.86380	-2.14515	2.74622
86	Point 9	3.94874	-0.02294	2.12380	3.83250	0.07718	2.09937	3.75358	0.10925	2.09325
87	Start of scan line	4.02545	-0.67817	2.31174	3.92247	-0.62341	2.30000	3.82454	-0.57134	2.28883
88	Middle of rotation	4.02545	-0.67817	2.31174	3.92247	-0.62341	2.30000	3.82454	-0.57134	2.28883
89	End of scan line	4.04162	-1.16307	2.45250	3.92934	-1.15860	2.45580	3.81937	-1.12321	2.44999
90										

FIG. 13A1



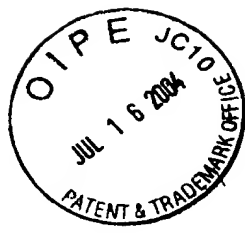
	A	B	C	D	E	F	G	H	I	J
91		Facet			Facet			Facet		
92	G2	7			9			11		
93	Point 1	4.02247	2.19033	2.58609	3.91799	2.45353	2.76685	3.80802	2.74420	2.96322
94	Point 2	3.79236	2.11753	2.69195	3.69690	2.36537	2.86040	3.58337	2.64904	3.05579
95	Point 3	3.78639	2.20453	2.73451	3.69690	2.36537	2.86040	3.58162	2.66095	3.06217
96	Point 4	3.05197	1.92230	3.05003	3.21262	2.17226	3.06533	2.85731	2.34705	3.35743
97	Point 5	2.64347	-0.27369	2.31221	2.81913	-0.34045	2.17660	2.54140	-0.10460	2.44937
98	Point 6	3.25774	-0.84215	1.68794	3.25935	-0.70440	1.74867	3.23044	-0.61969	1.80401
99	Point 7	3.29896	-0.76438	1.69797	3.25935	-0.70440	1.74867	3.23562	-0.60869	1.80582
100	Point 8	3.50262	-0.93172	1.50046	3.46547	-0.87482	1.54830	3.45674	-0.77127	1.59994
101	Point 9	4.02247	2.19033	2.58609	3.91799	2.45353	2.76685	3.80802	2.74420	2.96322
102	Start of scan line	3.88910	1.13139	2.19201	3.81752	1.25640	2.29108	3.73628	1.40993	2.40874
103	Middle of rotation	3.83943	0.57926	1.97459	3.76954	0.54210	2.00000	3.70069	0.50549	2.02503
104	End of scan line	3.77386	0.09914	1.79899	3.72144	0.14315	1.85024	3.66728	0.18290	1.90064
105										

FIG. 13A2



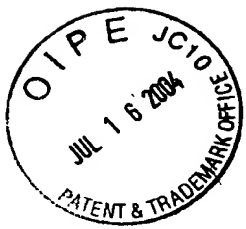
	A	B	C	D	E	F	G
106		Facet			Facet		
107	G3	1			2		
108	Point 1	5.11617	1.95380	1.89155	5.01400	1.88093	1.96715
109	Point 2	4.98460	1.86904	1.98969	4.88136	1.79109	2.06571
110	Point 3	4.94695	2.08109	2.03847	4.88064	1.79549	2.06667
111	Point 4	4.55990	1.69707	2.31542	4.46955	1.51422	2.37191
112	Point 5	4.35785	-1.63559	2.18575	4.29296	-1.52325	2.24765
113	Point 6	4.71038	-2.01784	1.86940	4.68022	-1.80322	1.91239
114	Point 7	4.77395	-1.80620	1.83693	4.68147	-1.79883	1.91177
115	Point 8	4.89971	-1.89063	1.72862	4.80732	-1.88882	1.80291
116	Point 9	5.11617	1.95380	1.89155	5.01400	1.88093	1.96715
117	Start of scan line	5.11614	1.00830	1.80878	5.02116	0.94389	1.87935
118	Middle of rotation	5.03523	0.00000	1.78542	4.95474	0.00000	1.85000
119	End of scan line	5.00607	-0.96140	1.72464	4.92129	-0.94701	1.79393
120							

FIG. 13A3A



	H	I	J	K	L	M
106	Facet			Facet		
107	3			4		
108	4.92433	1.81870	2.03365	4.82799	1.75935	2.10576
109	4.77964	1.72980	2.14196	4.68407	1.66502	2.21298
110	4.75362	1.86942	2.17507	4.68407	1.66502	2.21298
111	4.31720	1.51260	2.49402	4.34215	1.44090	2.46771
112	4.14486	-1.55897	2.36336	4.17995	-1.53887	2.33696
113	4.54753	-1.91413	2.00915	4.50146	-1.76326	2.05933
114	4.59009	-1.77513	1.98718	4.50146	-1.76326	2.05933
115	4.72764	-1.86391	1.86903	4.63750	-1.85821	1.94186
116	4.92433	1.81870	2.03365	4.82799	1.75935	2.10576
117	4.92928	0.88565	1.94798	4.84129	0.83137	2.01383
118	4.87537	0.00000	1.91369	4.79689	0.00000	1.97666
119	4.83778	-0.91710	1.86356	4.75656	-0.89961	1.93026
120						

FIG. 13A3B



Station 1 M1- XY Plane

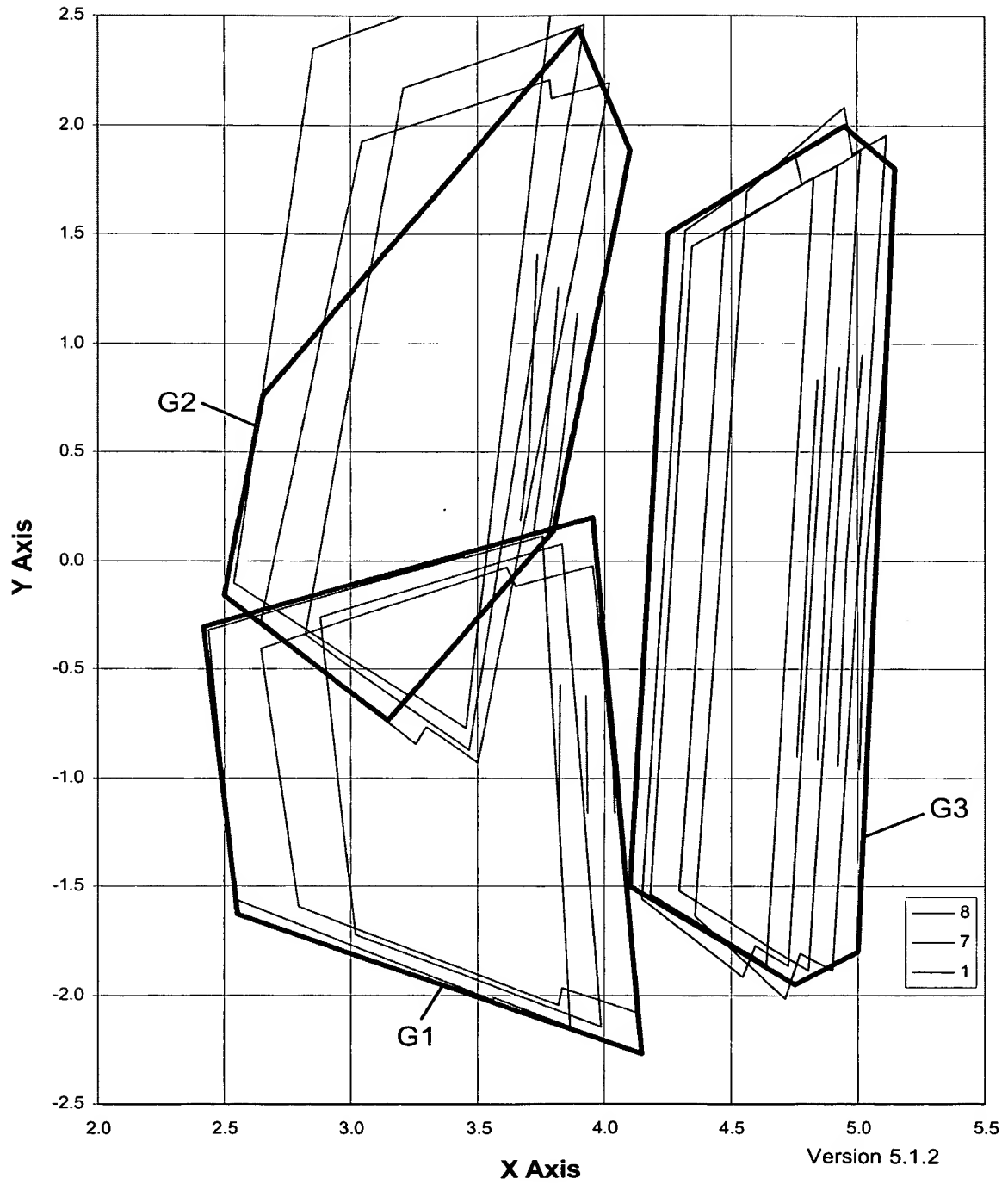
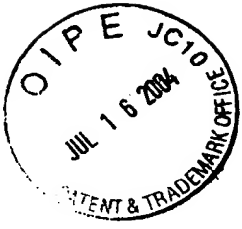
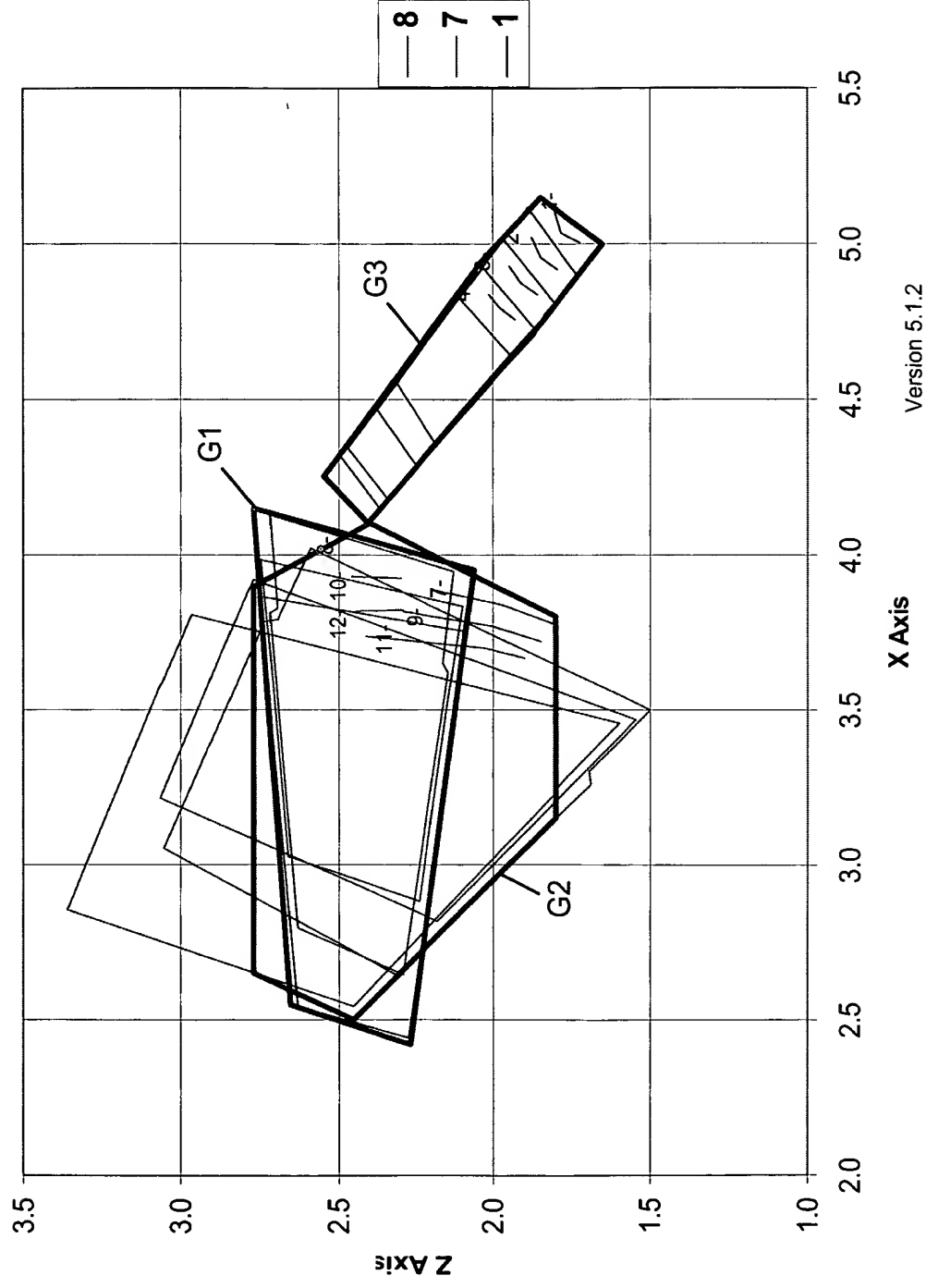


FIG. 13A4

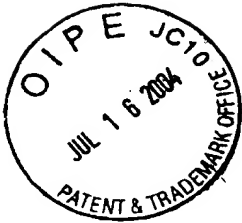


Station 1 M1 - XZ Plane



Version 5.1.2

FIG. 13A5



Station 1 M1 - YZ Plane

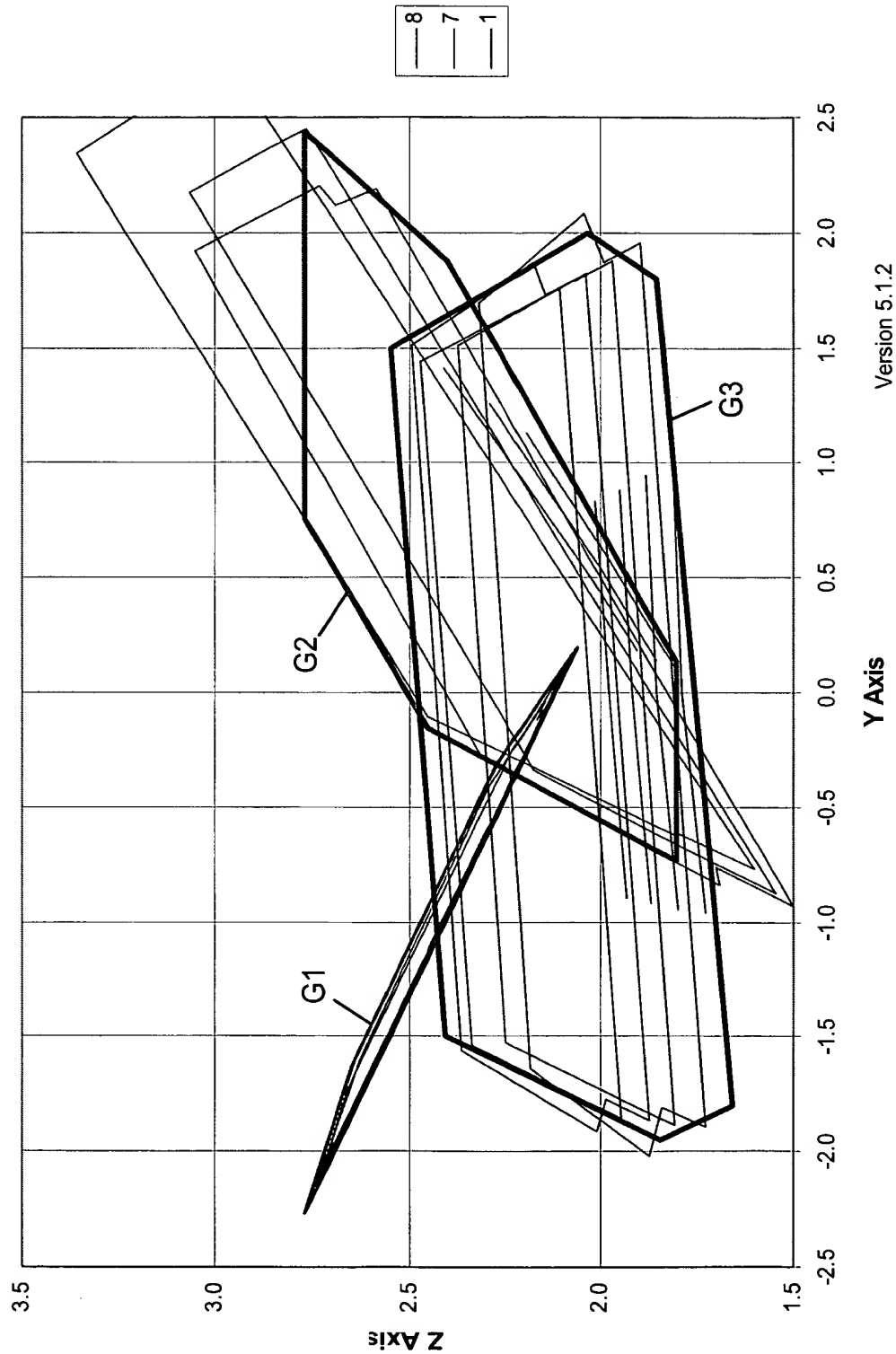
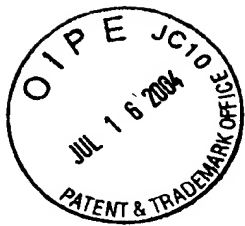


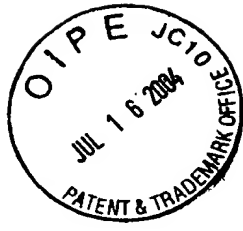
FIG. 13A6

Version 5.1.2



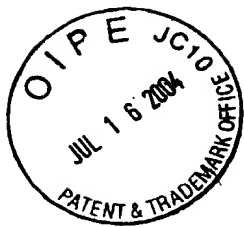
	A	B	C	D	E	F	G	H	I	J
75		1			2			3		
76		Facet			Facet			Facet		
77	G1	8			10			12		
78	Point 1	4.83616	-1.58677	0.84115	4.73669	-1.63993	0.66301	4.64314	-1.69543	0.50201
79	Point 2	4.68429	-1.81884	0.74767	4.58926	-1.86587	0.57304	4.48446	-1.93076	0.39587
80	Point 3	4.67878	-1.78796	0.69779	4.58926	-1.86587	0.57304	4.48358	-1.92664	0.38888
81	Point 4	4.22223	-2.50841	0.44377	4.28260	-2.33583	0.38592	4.00469	-2.63997	0.07232
82	Point 5	4.05858	-3.52592	1.25078	4.08790	-3.53306	1.33026	3.80481	-3.82416	0.98868
83	Point 6	4.46417	-3.19384	1.84067	4.36259	-3.30509	1.72614	4.23639	-3.46214	1.60614
84	Point 7	4.48187	-3.13482	1.81374	4.36259	-3.30509	1.72614	4.23895	-3.45403	1.60276
85	Point 8	4.62128	-3.01193	2.00617	4.49650	-3.19395	1.91915	4.38465	-3.33064	1.80981
86	Point 9	4.83616	-1.58677	0.84115	4.73669	-1.63993	0.66301	4.64314	-1.69543	0.50201
87	Start of scan line	4.79136	-1.94631	1.15786	4.70000	-2.00000	1.00000	4.60451	-2.05611	0.83500
88	Middle of rotation	4.79136	-1.94631	1.15786	4.70000	-2.00000	1.00000	4.60451	-2.05611	0.83500
89	End of scan line	4.69056	-2.50111	1.56984	4.58033	-2.64637	1.47458	4.46974	-2.76462	1.34651
90										

FIG. 13B1



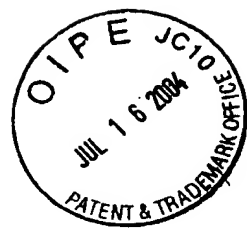
	A	B	C	D	E	F	G	H	I	J
91		Facet			Facet			Facet		
92	G2	7			9			11		
93	Point 1	3.38194	4.20092	1.75395	3.24016	4.43917	2.01655	3.11010	4.72655	2.34142
94	Point 2	3.16298	4.26385	1.78738	3.03125	4.49361	2.04162	2.88665	4.78740	2.37142
95	Point 3	3.16739	4.30137	1.83403	3.03125	4.49361	2.04162	2.88663	4.79258	2.37774
96	Point 4	2.50443	4.46930	1.90767	2.59900	4.60627	2.09349	2.21545	4.97231	2.46415
97	Point 5	1.39822	2.79582	-0.35302	1.44696	2.82994	-0.30174	1.08385	3.11226	-0.02918
98	Point 6	1.81707	2.39729	-0.75633	1.73748	2.57459	-0.55577	1.56833	2.71448	-0.41858
99	Point 7	1.85962	2.41646	-0.72451	1.73748	2.57459	-0.55577	1.57414	2.71711	-0.41422
100	Point 8	2.00251	2.29151	-0.84867	1.87437	2.45426	-0.67547	1.73191	2.58895	-0.53935
101	Point 9	3.38194	4.20092	1.75395	3.24016	4.43917	2.01655	3.11010	4.72655	2.34142
102	Start of scan line	3.14045	3.84670	1.27398	3.00728	4.05126	1.49719	2.86346	4.28889	1.75864
103	Middle of rotation	2.81784	3.26851	0.50471	2.60000	3.30000	0.50000	2.37384	3.33269	0.49511
104	End of scan line	2.37758	2.63817	-0.35149	2.22734	2.77029	-0.22004	2.06736	2.89843	-0.09537
105										

FIG. 13B2



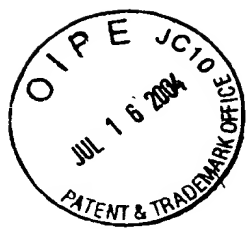
	A	B	C	D	E	F	G
106		Facet			Facet		
107	G3	1			2		
108	Point 1	4.36645	2.65376	0.19632	4.13039	2.57939	0.16456
109	Point 2	4.22328	2.62785	0.17673	3.98981	2.54937	0.14541
110	Point 3	4.17479	2.80928	0.16686	3.98888	2.55291	0.14522
111	Point 4	3.78746	2.62732	0.11577	3.58353	2.46410	0.09002
112	Point 5	3.59706	-1.89846	0.16625	3.42901	-1.80124	0.14108
113	Point 6	4.00140	-2.16622	0.22737	3.86105	-1.97527	0.20449
114	Point 7	4.06710	-1.99138	0.23359	3.86230	-1.97181	0.20460
115	Point 8	4.22016	-2.04815	0.25597	4.01328	-2.03180	0.22675
116	Point 9	4.36645	2.65376	0.19632	4.13039	2.57939	0.16456
117	Start of scan line	4.40361	1.87032	0.21487	4.17745	1.84317	0.18369
118	Middle of rotation	4.29670	0.23013	0.22786	4.10000	0.25000	0.20000
119	End of scan line	4.30920	-1.28070	0.25535	4.10701	-1.28789	0.22718
120							

FIG. 13B3A



	H	I	J	K	L	M
106	Facet			Facet		
107	3			4		
108	3.89207	2.57127	0.13136	3.63985	2.49916	0.09731
109	3.72893	2.54596	0.10897	3.48464	2.46924	0.07610
110	3.69351	2.66161	0.10205	3.48464	2.46924	0.07610
111	3.24144	2.51989	0.04122	3.13971	2.40274	0.02898
112	3.10957	-1.84718	0.09718	3.03925	-1.79742	0.08649
113	3.58373	-2.08109	0.16749	3.40752	-1.93323	0.14032
114	3.62849	-1.96992	0.17186	3.40752	-1.93323	0.14032
115	3.80192	-2.02808	0.19711	3.57430	-1.99474	0.16470
116	3.89207	2.57127	0.13136	3.63985	2.49916	0.09731
117	3.94222	1.82246	0.15114	3.70025	1.80404	0.11760
118	3.89313	0.27090	0.17070	3.67474	0.29297	0.13978
119	3.89234	-1.26997	0.19685	3.66999	-1.27076	0.16575
120						

FIG. 13B3B



Station 1 M2- XY Plane

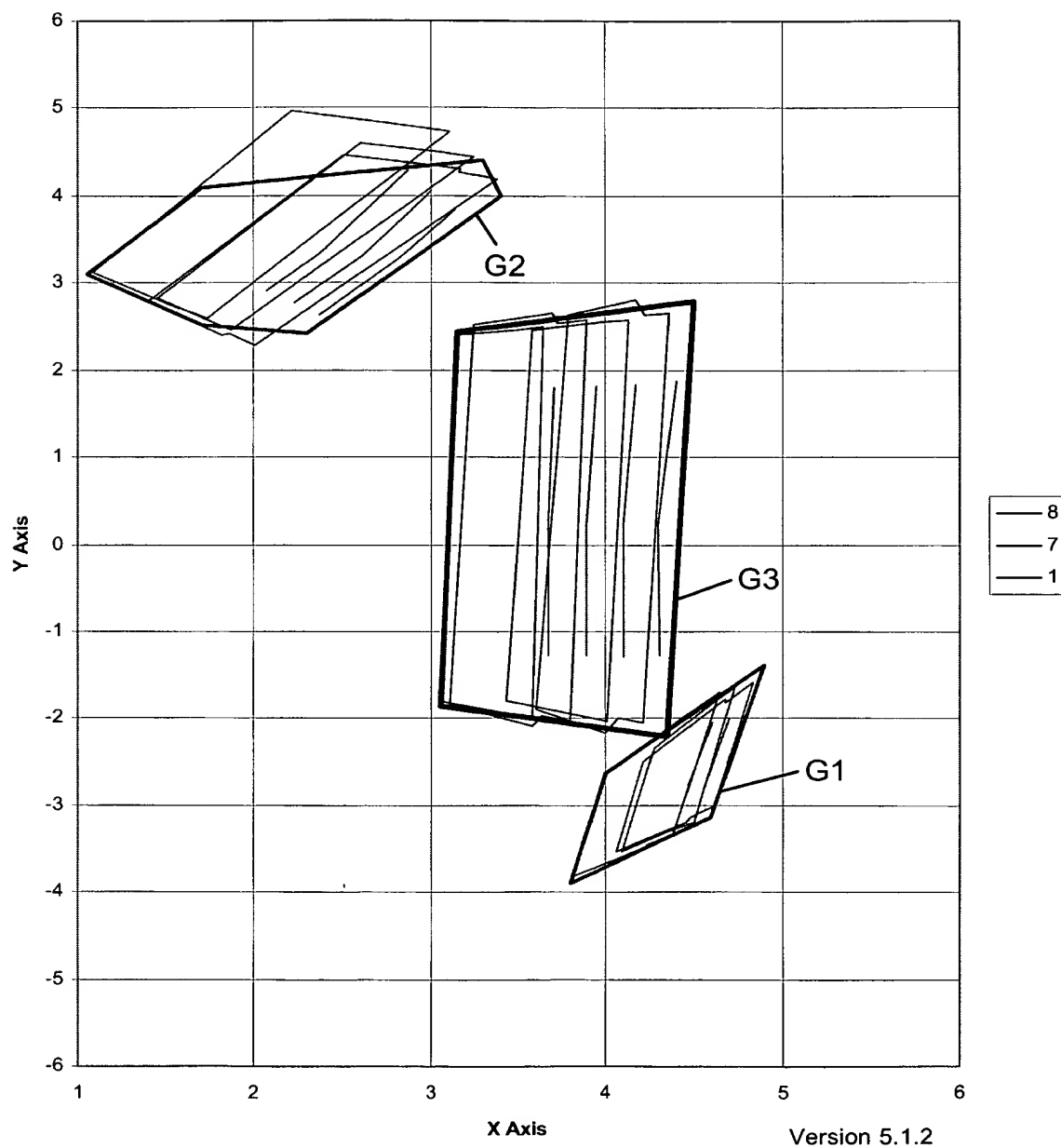


FIG. 13B4

Station 1 M2 - XZ Plane

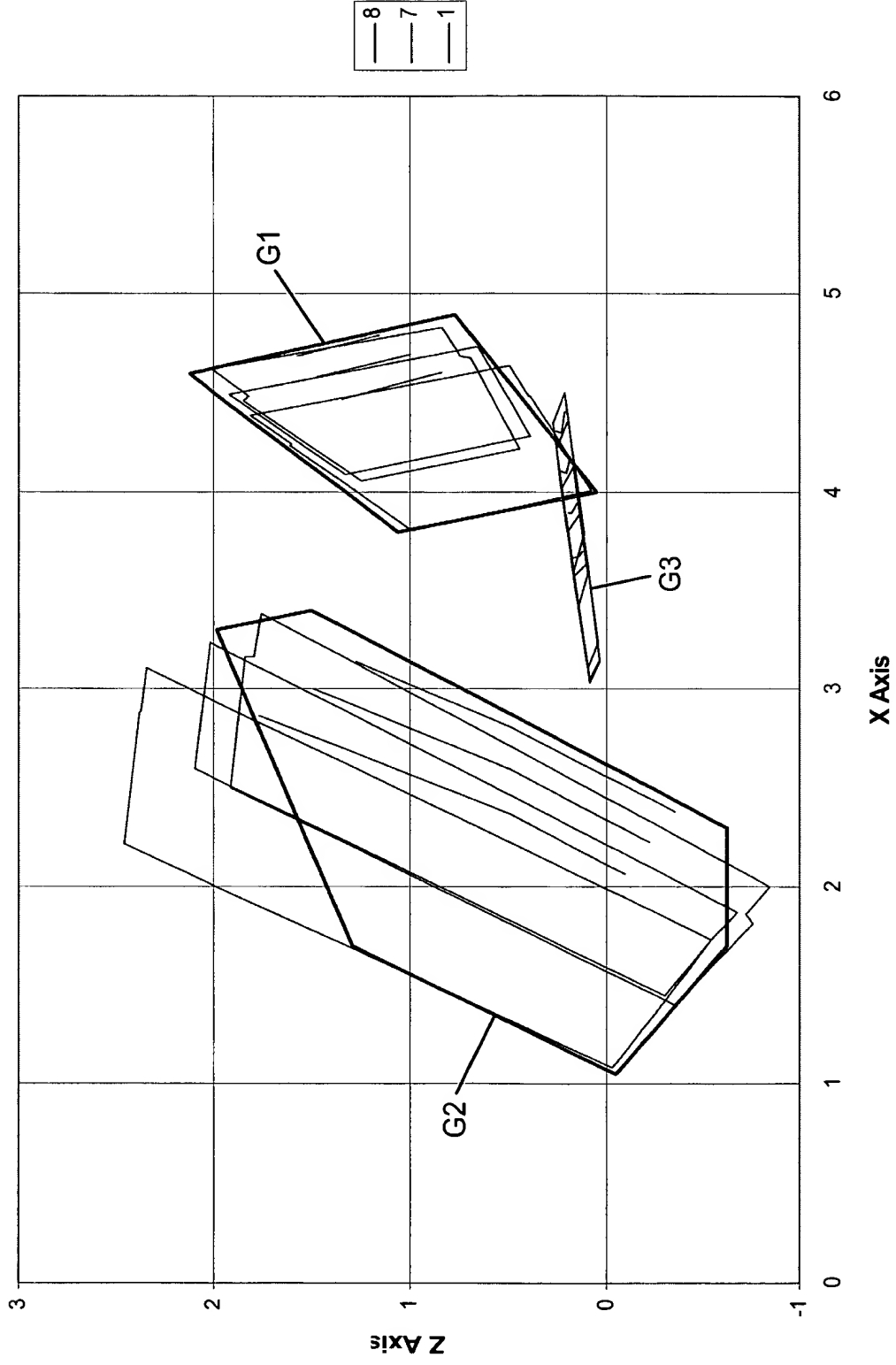
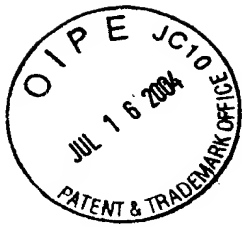


FIG. 13B5



Station 1 M2 - YZ Plane

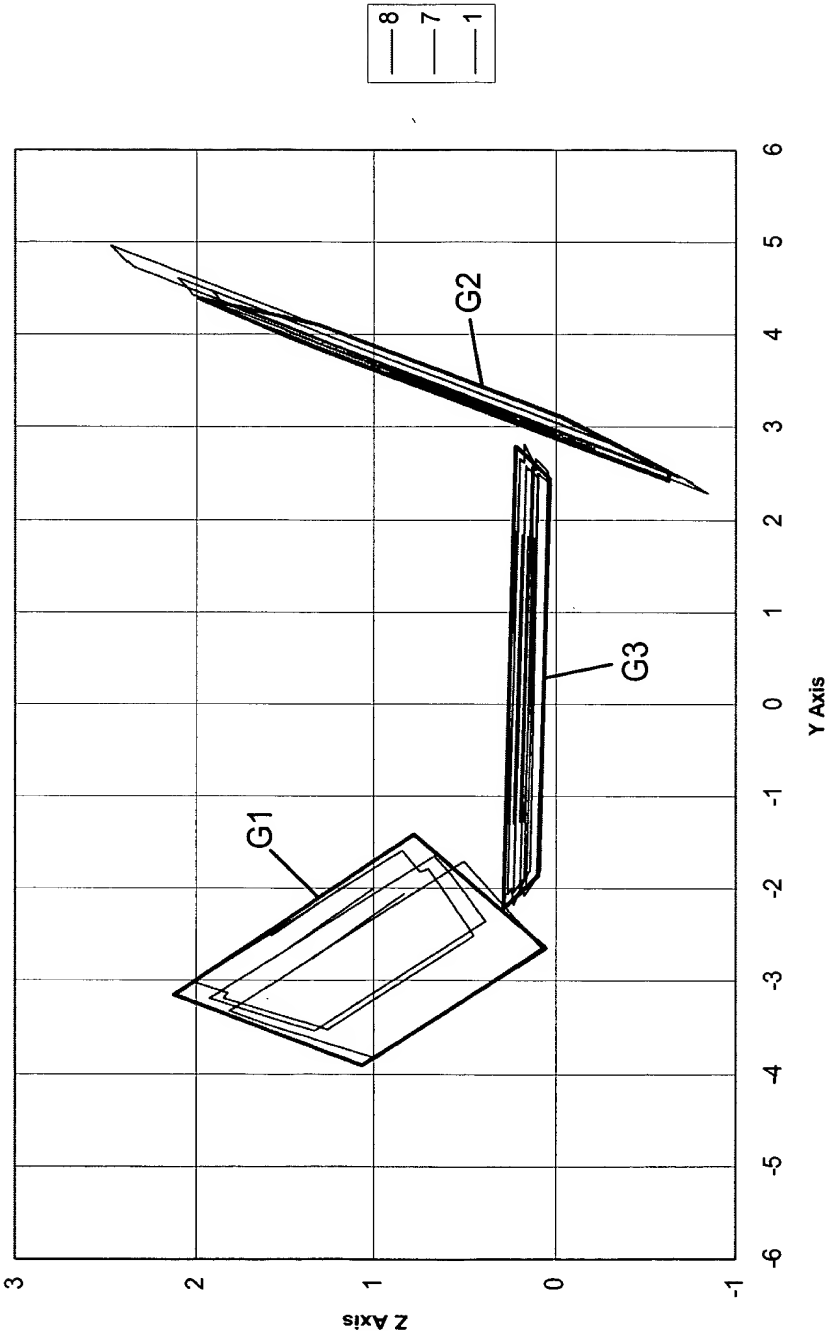
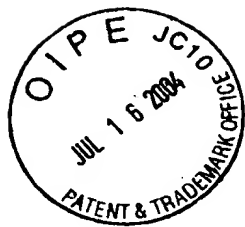
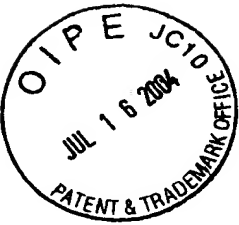


FIG. 13B6



	A	B	C	D	E	F	G	H	I	J
75		1			2			3		
76		Facet			Facet			Facet		
77	G1	8			10			12		
78	Point 1	1.20537	-1.67340	0.83287	1.73454	-1.76256	0.57847	2.18607	-1.81295	0.33975
79	Point 2	1.50717	-1.82194	0.77007	2.01252	-1.90575	0.52600	2.50076	-1.97962	0.28421
80	Point 3	1.53373	-1.80077	0.73570	2.01252	-1.90575	0.52600	2.50470	-1.97622	0.27888
81	Point 4	2.71992	-2.40114	0.50283	2.72609	-2.27331	0.39129	3.72651	-2.62604	0.06549
82	Point 5	2.86809	-3.52973	1.36131	2.87153	-3.57274	1.39541	3.86534	-3.82116	0.98584
83	Point 6	1.66004	-3.29877	1.91900	2.13984	-3.43596	1.73579	2.62296	-3.60007	1.57321
84	Point 7	1.63442	-3.25853	1.90105	2.13984	-3.43596	1.73579	2.61924	-3.59386	1.57029
85	Point 8	1.32257	-3.19447	2.04127	1.85089	-3.38194	1.87021	2.29384	-3.53522	1.72352
86	Point 9	1.20537	-1.67340	0.83287	1.73454	-1.76256	0.57847	2.18607	-1.81295	0.33975
87	Start of scan line	1.19058	-1.90430	1.03659	1.70000	-2.00000	0.80000	2.15170	-2.08486	0.59022
88	Middle of rotation	1.19058	-1.90430	1.03659	1.70000	-2.00000	0.80000	2.15170	-2.08486	0.59022
89	End of scan line	1.33110	-2.85916	1.75349	1.84105	-3.01433	1.56667	2.29073	-3.10310	1.36142
90										

FIG. 13C1



Station 1 M3- XY Plane

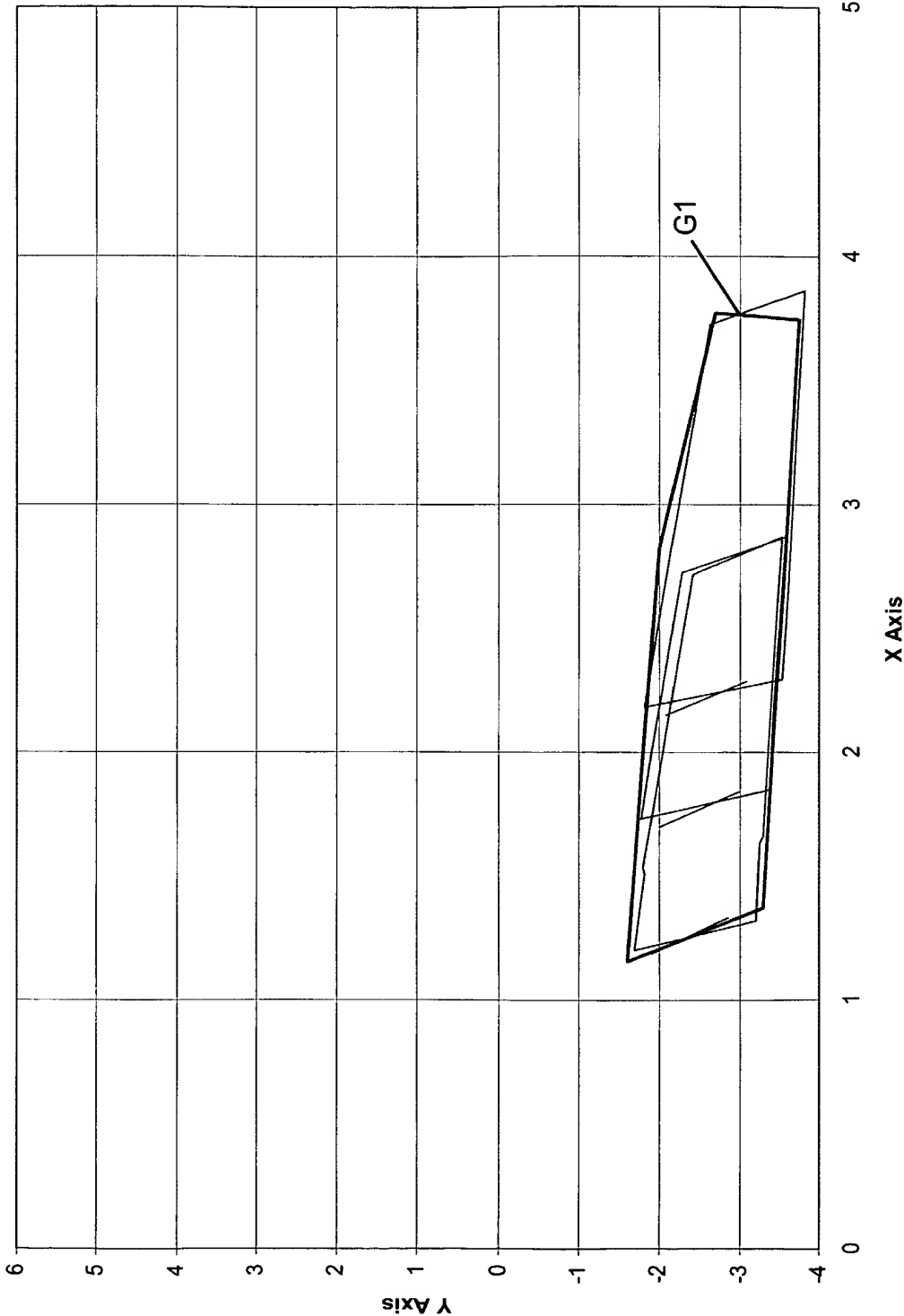
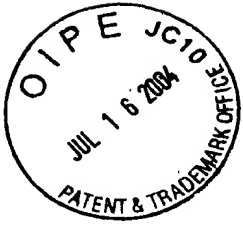


FIG. 13C2



Station 1 M3 - XZ Plane

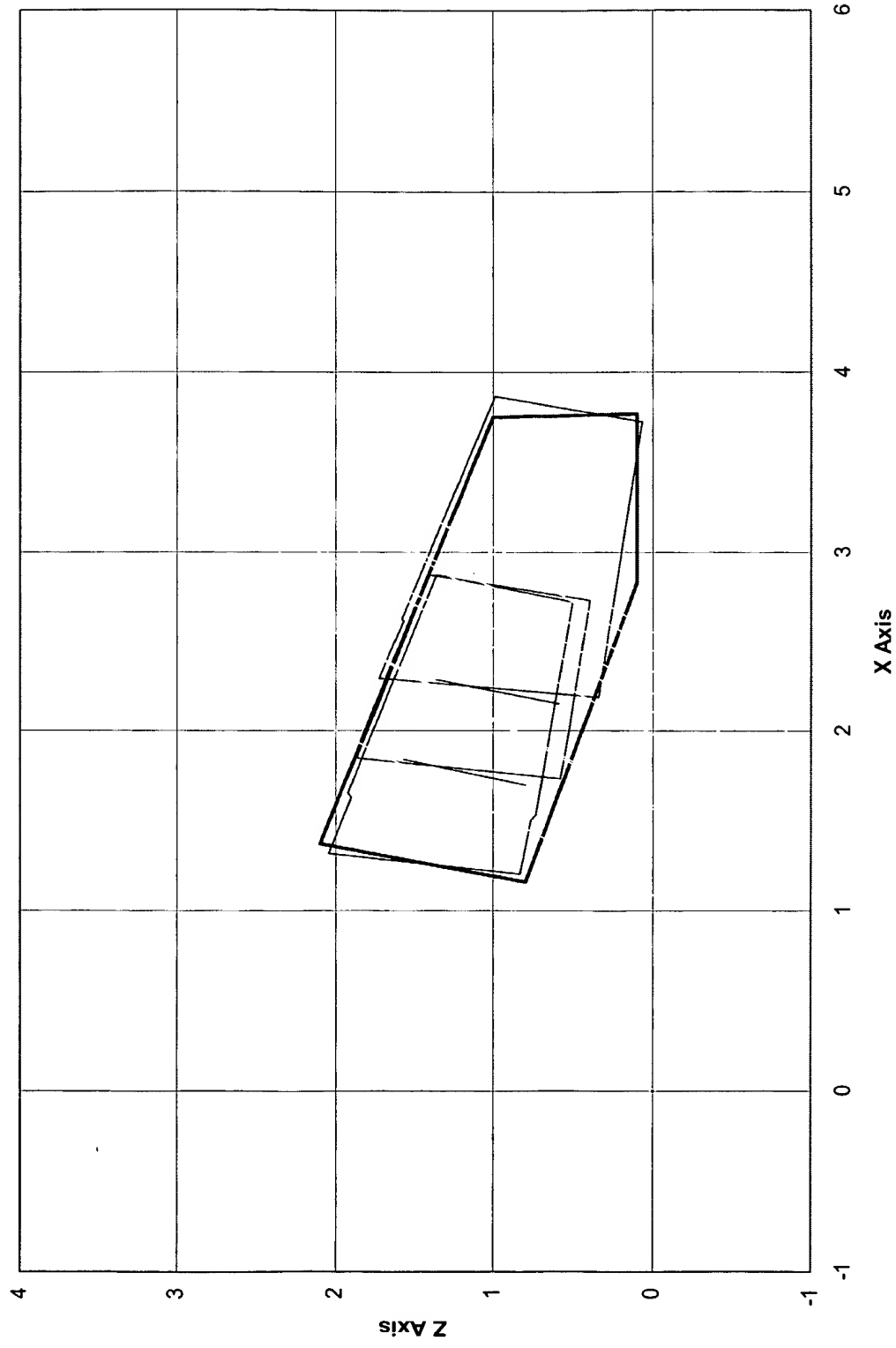
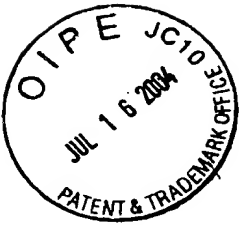


FIG. 13C3



Station 1 M3 - YZ Plane

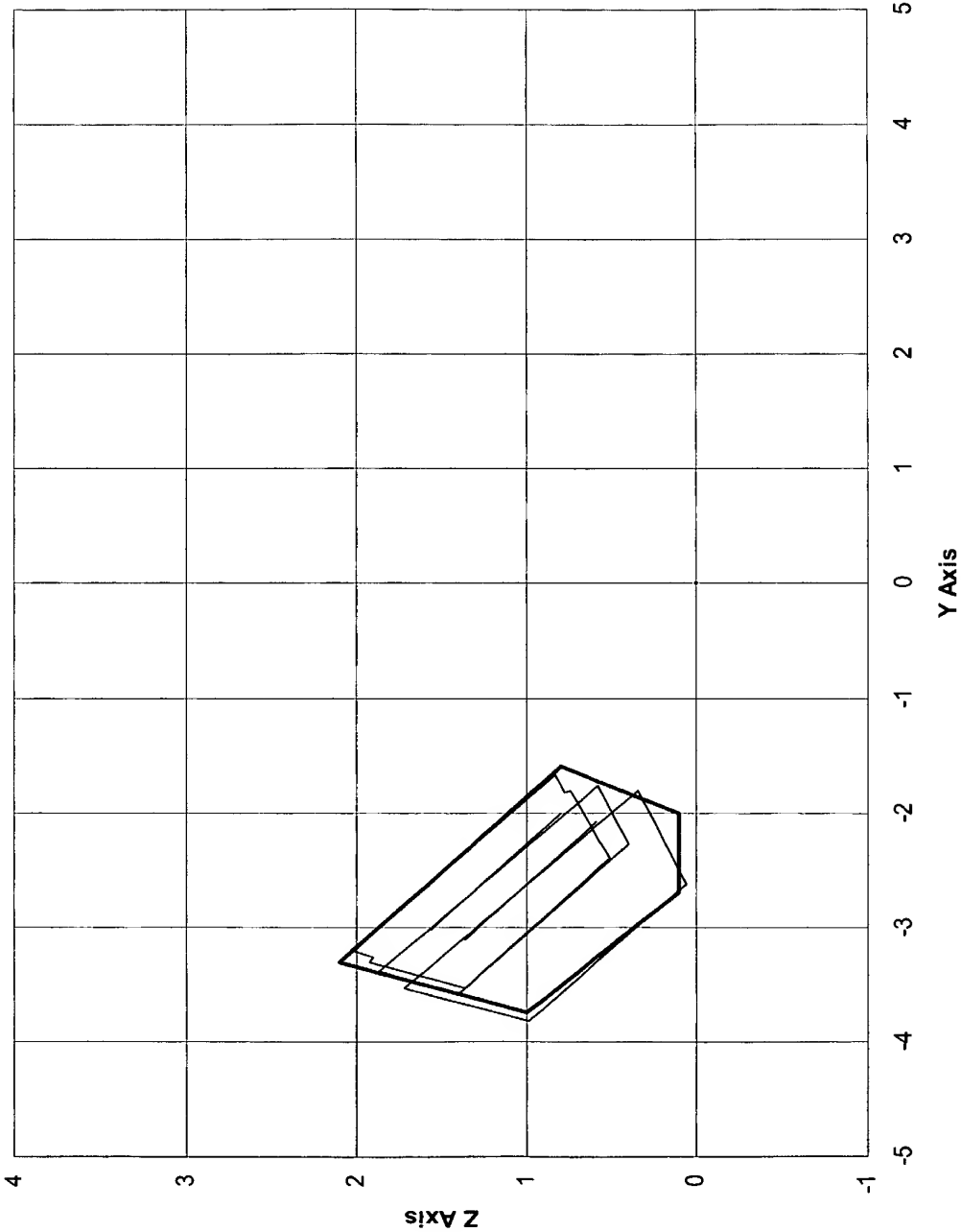
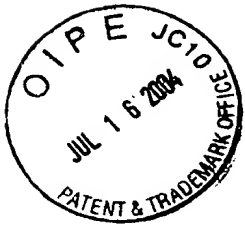
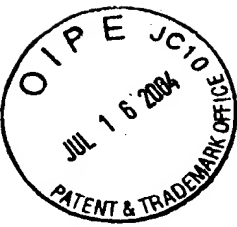


FIG. 13C4



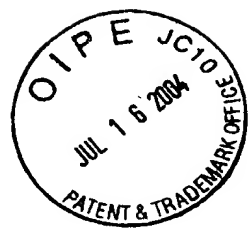
	A	B	C	D	E	F	G	H	I	J
75		1			2			3		
76		Facet			Facet			Facet		
77	G1	8			10			12		
78	Point 1	1.20537	-1.67340	0.83287	1.73454	-1.76256	0.57847	2.18607	-1.81295	0.33975
79	Point 2	1.50717	-1.82194	0.77007	2.01252	-1.90575	0.52600	2.50076	-1.97962	0.28421
80	Point 3	1.53373	-1.80077	0.73570	2.01252	-1.90575	0.52600	2.50470	-1.97622	0.27888
81	Point 4	2.71992	-2.40114	0.50283	2.72609	-2.27331	0.39129	3.72651	-2.62604	0.06549
82	Point 5	2.86809	-3.52973	1.36131	2.87153	-3.57274	1.39541	3.86534	-3.82116	0.98584
83	Point 6	1.66004	-3.29877	1.91900	2.13984	-3.43596	1.73579	2.62296	-3.60007	1.57321
84	Point 7	1.63442	-3.25853	1.90105	2.13984	-3.43596	1.73579	2.61924	-3.59386	1.57029
85	Point 8	1.32257	-3.19447	2.04127	1.85089	-3.38194	1.87021	2.29384	-3.53522	1.72352
86	Point 9	1.20537	-1.67340	0.83287	1.73454	-1.76256	0.57847	2.18607	-1.81295	0.33975
87	Start of scan line	1.19058	-1.90430	1.03659	1.70000	-2.00000	0.80000	2.15170	-2.08486	0.59022
88	Middle of rotation	1.19058	-1.90430	1.03659	1.70000	-2.00000	0.80000	2.15170	-2.08486	0.59022
89	End of scan line	1.33110	-2.85916	1.75349	1.84105	-3.01433	1.56667	2.29073	-3.10310	1.36142
90										

FIG. 13D1



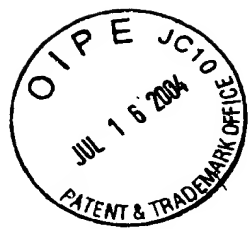
	A	B	C	D	E	F	G	H	I	J
105										
106		Facet			Facet			Facet		
107	G3	1			2			3		
108	Point 1	5.04006	0.52476	1.76314	4.94178	0.55167	1.81997	4.85731	0.53894	1.86881
109	Point 2	4.87042	0.44428	1.86123	4.77196	0.46655	1.91816	4.67548	0.45660	1.97394
110	Point 3	4.83173	0.66283	1.88360	4.77125	0.47110	1.91857	4.65020	0.60068	1.98856
111	Point 4	4.32129	0.28599	2.17873	4.24022	0.20212	2.22561	4.09186	0.25949	2.31139
112	Point 5	4.34770	-1.84845	2.16347	4.26992	-1.86717	2.20844	4.08721	-1.77102	2.31408
113	Point 6	4.77372	-2.25670	1.91714	4.71924	-2.17652	1.94864	4.56410	-2.15769	2.03834
114	Point 7	4.83579	-2.04739	1.88125	4.72049	-2.17219	1.94791	4.60668	-2.01968	2.01372
115	Point 8	4.98278	-2.13965	1.79626	4.86407	-2.27009	1.86490	4.76563	-2.11752	1.92182
116	Point 9	5.04006	0.52476	1.76314	4.94178	0.55167	1.81997	4.85731	0.53894	1.86881
117	Start of scan line	5.02090	0.00000	1.77422	4.92826	0.00000	1.82778	4.83795	0.00000	1.88000
118	Middle of rotation	5.02090	0.00000	1.77422	4.92826	0.00000	1.82778	4.83795	0.00000	1.88000
119	End of scan line	5.06055	-1.14492	1.75129	4.96268	-1.22889	1.80788	4.85432	-1.09333	1.87053
120										

FIG. 14A1A



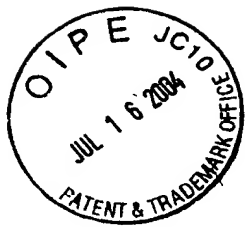
	K	L	M	N	O	P	Q	R	S
105									
106	Facet			Facet			Facet		
107	4			5			6		
108	4.76146	0.57105	1.92423	4.59494	0.56809	2.02051	4.42086	0.60393	2.12116
109	4.58109	0.48315	2.02852	4.39766	0.48153	2.13458	4.21826	0.51160	2.23831
110	4.58109	0.48315	2.02852	4.39672	0.48704	2.13512	4.21826	0.51160	2.23831
111	4.14950	0.27280	2.27807	3.77405	0.21047	2.49515	3.84486	0.34144	2.45421
112	4.12497	-1.92124	2.29225	3.74166	-1.46848	2.51388	3.79316	-1.27109	2.48410
113	4.49172	-2.17143	2.08019	4.30150	-1.80374	2.19018	4.13935	-1.47056	2.28393
114	4.49172	-2.17143	2.08019	4.30312	-1.79844	2.18924	4.13935	-1.47056	2.28393
115	4.64469	-2.27578	1.99174	4.48021	-1.90337	2.08685	4.32687	-1.57861	2.17551
116	4.76146	0.57105	1.92423	4.59494	0.56809	2.02051	4.42086	0.60393	2.12116
117	4.74966	0.00000	1.93105	4.57806	0.00000	2.03027	4.41147	0.00000	2.12659
118	4.74966	0.00000	1.93105	4.57806	0.00000	2.03027	4.41147	0.00000	2.12659
119	4.76001	-1.19617	1.92507	4.57039	-0.89357	2.03470	4.40142	-0.64218	2.13240
120									

FIG. 14A1B



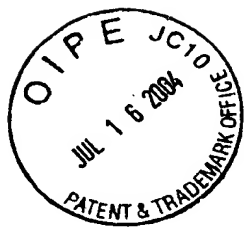
	A	B	C	D	E	F	G	H	I	J
105										
106		Facet			Facet			Facet		
107	G3	1			2			3		
108	Point 1	4.82498	0.44237	0.26978	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770
109	Point 2	4.66874	0.36963	0.24652	4.50103	0.37345	0.19944	4.31949	0.37132	0.15017
110	Point 3	4.62719	0.54611	0.18746	4.50022	0.37701	0.19826	4.28911	0.48536	0.11104
111	Point 4	4.18842	0.22763	0.15299	4.04652	0.15472	0.13371	3.79612	0.20147	0.05234
112	Point 5	4.29176	-2.24588	0.84926	4.17480	-2.32513	0.83855	3.90727	-2.24907	0.74455
113	Point 6	4.69167	-2.49257	1.02567	4.59519	-2.46863	0.99272	4.37431	-2.45821	0.92926
114	Point 7	4.74716	-2.30530	0.99034	4.59627	-2.46486	0.99200	4.41150	-2.33743	0.90686
115	Point 8	4.89443	-2.35176	1.04332	4.74099	-2.51341	1.04484	4.57811	-2.38443	0.96529
116	Point 9	4.82498	0.44237	0.26978	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770
117	Start of scan line	4.82442	0.00000	0.38908	4.66490	0.00000	0.34528	4.50000	-0.00001	0.30000
118	Middle of rotation	4.82442	0.00000	0.38907	4.66490	0.00000	0.34528	4.50000	0.00000	0.30000
119	End of scan line	4.94361	-1.51167	0.82998	4.80210	-1.65515	0.82987	4.62188	-1.53817	0.74880
120										

FIG. 14B1A



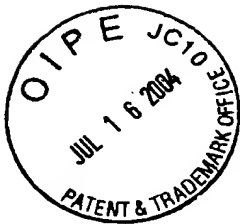
	K	L	M	N	O	P	Q	R	S
105									
106	Facet			Facet			Facet		
107	4			5			6		
108	4.30775	0.44954	0.12583	3.93952	0.44834	0.02505	3.52125	0.44891	-0.08994
109	4.14124	0.37427	0.10044	3.74647	0.37385	-0.00784	3.32508	0.37322	-0.12337
110	4.14124	0.37427	0.10044	3.74516	0.37803	-0.00933	3.32508	0.37322	-0.12337
111	3.76359	0.20355	0.04285	3.17535	0.15541	-0.10566	2.98199	0.24084	-0.18182
112	3.89193	-2.41913	0.78626	3.29187	-2.00085	0.50856	3.10607	-1.64117	0.36043
113	4.25097	-2.52955	0.91466	3.86517	-2.15630	0.70794	3.47166	-1.74831	0.48974
114	4.25097	-2.52955	0.91466	3.86651	-2.15188	0.70712	3.47166	-1.74831	0.48974
115	4.41114	-2.57881	0.97193	4.06339	-2.20429	0.77533	3.68342	-1.81036	0.56463
116	4.30775	0.44954	0.12583	3.93952	0.44834	0.02505	3.52125	0.44891	-0.08994
117	4.32901	0.00000	0.25305	3.96553	0.00000	0.15325	3.56687	0.00000	0.04380
118	4.32901	0.00000	0.25305	3.96553	0.00000	0.15325	3.56687	0.00000	0.04380
119	4.47185	-1.71403	0.75509	4.08537	-1.40033	0.56428	3.67805	-1.09574	0.37020
120									

FIG. 14B1B



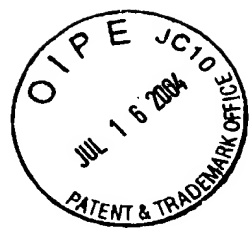
	A	B	C	D	E	F	G	H	I	J
105										
106		Facet			Facet			Facet		
107 G3		1			2			3		
108	Point 1	4.82498	0.44237	0.26978	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770
109	Point 2	4.66874	0.36963	0.24652	4.50103	0.37345	0.19944	4.31949	0.37132	0.15017
110	Point 3	4.62719	0.54611	0.18746	4.50022	0.37701	0.19826	4.28911	0.48536	0.11104
111	Point 4	4.18842	0.22763	0.15299	4.04652	0.15472	0.13371	3.79612	0.20147	0.05234
112	Point 5	4.29176	-2.24588	0.84926	4.17480	-2.32513	0.83855	3.90727	-2.24907	0.74455
113	Point 6	4.69167	-2.49257	1.02567	4.59519	-2.46863	0.99272	4.37431	-2.45821	0.92926
114	Point 7	4.74716	-2.30530	0.99034	4.59627	-2.46486	0.99200	4.41150	-2.33743	0.90686
115	Point 8	4.89443	-2.35176	1.04332	4.74099	-2.51341	1.04484	4.57811	-2.38443	0.96529
116	Point 9	4.82498	0.44237	0.26978	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770
117	Start of scan line	4.82442	0.00000	0.38908	4.66490	0.00000	0.34528	4.50000	-0.00001	0.30000
118	Middle of rotation	4.82442	0.00000	0.38907	4.66490	0.00000	0.34528	4.50000	0.00000	0.30000
119	End of scan line	4.94361	-1.51167	0.82998	4.80210	-1.65515	0.82987	4.62188	-1.53817	0.74880
120										

FIG. 14C1A



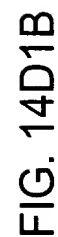
	K	L	M	N	O	P	Q	R	S
105									
106	Facet			Facet			Facet		
107	4			5			6		
108	4.30775	0.44954	0.12583	3.93952	0.44834	0.02505	3.52125	0.44891	-0.08994
109	4.14124	0.37427	0.10044	3.74647	0.37385	-0.00784	3.32508	0.37322	-0.12337
110	4.14124	0.37427	0.10044	3.74516	0.37803	-0.00933	3.32508	0.37322	-0.12337
111	3.76359	0.20355	0.04285	3.17535	0.15541	-0.10566	2.98199	0.24084	-0.18182
112	3.89193	-2.41913	0.78626	3.29187	-2.00085	0.50856	3.10607	-1.64117	0.36043
113	4.25097	-2.52955	0.91466	3.86517	-2.15630	0.70794	3.47166	-1.74831	0.48974
114	4.25097	-2.52955	0.91466	3.86651	-2.15188	0.70712	3.47166	-1.74831	0.48974
115	4.41114	-2.57881	0.97193	4.06339	-2.20429	0.77533	3.68342	-1.81036	0.56463
116	4.30775	0.44954	0.12583	3.93952	0.44834	0.02505	3.52125	0.44891	-0.08994
117	4.32901	0.00000	0.25305	3.96553	0.00000	0.15325	3.56687	0.00000	0.04380
118	4.32901	0.00000	0.25305	3.96553	0.00000	0.15325	3.56687	0.00000	0.04380
119	4.47185	-1.71403	0.75509	4.08537	-1.40033	0.56428	3.67805	-1.09574	0.37020
120									

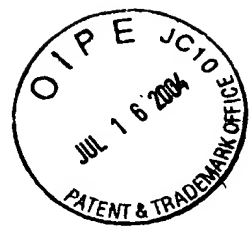
FIG. 14C1B



	A	B	C	D	E	F	G	H	I	J
105										
106		Facet			Facet			Facet		
107	G3	1			2			3		
108	Point 1	4.82498	0.44237	0.26978	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770
109	Point 2	4.66874	0.36963	0.24652	4.50103	0.37345	0.19944	4.31949	0.37132	0.15017
110	Point 3	4.62719	0.54611	0.18746	4.50022	0.37701	0.19826	4.28911	0.48536	0.11104
111	Point 4	4.18842	0.22763	0.15299	4.04652	0.15472	0.13371	3.79612	0.20147	0.05234
112	Point 5	4.29176	-2.24588	0.84926	4.17480	-2.32513	0.83855	3.90727	-2.24907	0.74455
113	Point 6	4.69167	-2.49257	1.02567	4.59519	-2.46863	0.99272	4.37431	-2.45821	0.92926
114	Point 7	4.74716	-2.30530	0.99034	4.59627	-2.46486	0.99200	4.41150	-2.33743	0.90686
115	Point 8	4.89443	-2.35176	1.04332	4.74099	-2.51341	1.04484	4.57811	-2.38443	0.96529
116	Point 9	4.82498	0.44237	0.26978	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770
117	Start of scan line	4.82442	0.00000	0.38908	4.66490	0.00000	0.34528	4.50000	-0.00001	0.30000
118	Middle of rotation	4.82442	0.00000	0.38907	4.66490	0.00000	0.34528	4.50000	0.00000	0.30000
119	End of scan line	4.94361	-1.51167	0.82998	4.80210	-1.65515	0.82987	4.62188	-1.53817	0.74880
120										

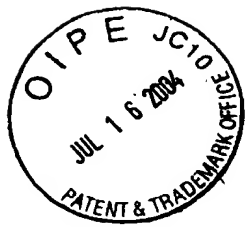
FIG. 14D1A

[illegible]



	A	B	C	D	E	F	G	H	I	J
75		1			2			3		
76		Facet			Facet			Facet		
77	G1	8			10			12		
78	Point 1	5.95032	-0.72592	5.72516	5.75912	-0.72344	5.84633	5.57831	-0.71341	5.95933
79	Point 2	5.80752	-0.82205	5.83575	5.62511	-0.81564	5.95052	5.42747	-0.80763	6.07464
80	Point 3	5.79099	-0.77284	5.83618	5.62511	-0.81564	5.95052	5.42531	-0.80078	6.07461
81	Point 4	5.35054	-1.10363	6.18430	5.33722	-1.01369	6.17433	4.95130	-1.10154	6.43794
82	Point 5	5.44406	-4.23150	6.76631	5.37166	-4.30055	6.82654	4.94319	-4.40584	7.12079
83	Point 6	5.82668	-4.38204	6.55370	5.60403	-4.39100	6.69722	5.33088	-4.56037	6.90578
84	Point 7	5.83655	-4.33627	6.53803	5.60403	-4.39100	6.69722	5.33250	-4.55423	6.90349
85	Point 8	5.95867	-4.37550	6.46837	5.71110	-4.43267	6.63764	5.45432	-4.60159	6.83568
86	Point 9	5.95032	-0.72592	5.72516	5.75912	-0.72344	5.84633	5.57831	-0.71341	5.95933
87	Start of scan line	5.99623	-1.21758	5.79678	5.80609	-1.19815	5.91380	5.61623	-1.19501	6.03397
88	Middle of rotation	6.00363	-1.72998	5.89717	5.80862	-1.62630	6.00000	5.61481	-1.52325	6.10220
89	End of scan line	5.95828	-3.76722	6.34386	5.72650	-3.84809	6.50794	5.48105	-3.93033	6.68100
90										

FIG. 15A1



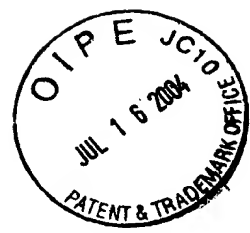
	A	B	C	D	E	F	G	H	I	J
91		Facet			Facet			Facet		
92	G2	7			9			11		
93	Point 1	5.95867	4.37550	6.46837	5.71110	4.43267	6.63764	5.45432	4.60159	6.83568
94	Point 2	5.83655	4.33627	6.53803	5.60403	4.39100	6.69722	5.33250	4.55423	6.90349
95	Point 3	5.82668	4.38204	6.55370	5.60403	4.39100	6.69722	5.33088	4.56037	6.90578
96	Point 4	5.44406	4.23150	6.76631	5.37166	4.30055	6.82654	4.94319	4.40584	7.12079
97	Point 5	5.35054	1.10363	6.18430	5.33722	1.01369	6.17433	4.95130	1.10154	6.43794
98	Point 6	5.79099	0.77284	5.83618	5.62511	0.81564	5.95052	5.42531	0.80078	6.07461
99	Point 7	5.80752	0.82205	5.83575	5.62511	0.81564	5.95052	5.42747	0.80763	6.07464
100	Point 8	5.95032	0.72592	5.72516	5.75912	0.72344	5.84633	5.57831	0.71341	5.95933
101	Point 9	5.95867	4.37550	6.46837	5.71110	4.43267	6.63764	5.45432	4.60159	6.83568
102	Start of scan line	5.95828	3.76722	6.34386	5.72650	3.84809	6.50794	5.48105	3.93033	6.68100
103	Middle of rotation	6.00363	1.72998	5.89717	5.80862	1.62630	6.00000	5.61481	1.52325	6.10220
104	End of scan line	5.99623	1.21758	5.79678	5.80609	1.19815	5.91380	5.61623	1.19501	6.03397
105										

FIG. 15A2



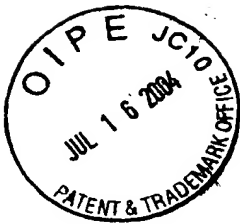
	A	B	C	D	E	F	G	H	I	J
106		Facet			Facet			Facet		
107	G3	1			2			3		
108	Point 1	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445
109	Point 2	7.33669	0.30677	3.72290	7.27018	0.29548	3.93289	7.20014	0.30320	4.16642
110	Point 3	7.35085	0.45214	3.76848	7.27046	0.29830	3.93374	7.20860	0.39685	4.19794
111	Point 4	7.19969	0.19089	4.09695	7.13404	0.12287	4.26827	7.04932	0.16475	4.57132
112	Point 5	6.76168	-2.71194	3.69330	6.69289	-2.84072	3.83654	6.61109	-2.72069	4.17939
113	Point 6	6.82335	-2.91744	3.36219	6.76969	-2.95787	3.51184	6.69286	-2.89597	3.80174
114	Point 7	6.86196	-2.76529	3.33225	6.77043	-2.95493	3.51128	6.71818	-2.79811	3.78090
115	Point 8	6.89054	-2.80469	3.21407	6.79682	-2.99436	3.40022	6.75093	-2.83803	3.64875
116	Point 9	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445
117	Start of scan line	7.32381	0.00361	3.57345	7.25890	0.00056	3.78342	7.19246	0.00004	4.00001
118	Middle of rotation	7.32325	0.00000	3.57301	7.25882	0.00000	3.78335	7.19245	0.00000	4.00000
119	End of scan line	7.01771	-2.11473	3.23472	6.92439	-2.31840	3.41071	6.87855	-2.14504	3.66987
120										

FIG. 15A3A



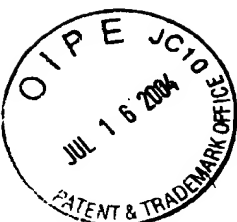
	K	L	M	N	O	P	Q	R	S
106	Facet			Facet			Facet		
107	4			5			6		
108	7.17887	0.35054	4.26573	7.03508	0.35981	4.74102	6.87159	0.34512	5.26544
109	7.13030	0.29192	4.38726	6.97894	0.30016	4.88659	6.81701	0.28708	5.40695
110	7.13030	0.29192	4.38726	6.97921	0.30354	4.88784	6.81701	0.28708	5.40695
111	7.02005	0.15884	4.66313	6.81288	0.12498	5.31804	6.72143	0.18544	5.65479
112	6.55131	-2.93734	4.23771	6.36745	-2.80040	4.92441	6.22148	-3.06048	5.23666
113	6.61699	-3.02659	3.96692	6.47664	-2.92071	4.49196	6.28421	-3.12902	4.98858
114	6.61699	-3.02659	3.96692	6.47758	-2.91719	4.49112	6.28421	-3.12902	4.98858
115	6.64613	-3.06618	3.84679	6.51493	-2.95743	4.34377	6.32024	-3.16838	4.84610
116	7.17887	0.35054	4.26573	7.03508	0.35981	4.74102	6.87159	0.34512	5.26544
117	7.12389	-0.00002	4.22381	6.97902	0.00007	4.69680	6.82144	0.00006	5.21121
118	7.12389	0.00000	4.22382	6.97901	0.00000	4.69679	6.82143	0.00000	5.21120
119	6.77390	-2.39464	3.85384	6.64346	-2.26763	4.35990	6.44831	-2.50435	4.84743
120									

FIG. 15A3B



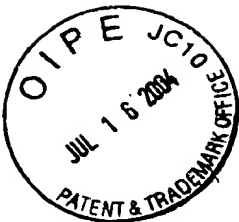
	A	B	C	D	E	F	G	H	I	J
75		1			2			3		
76		Facet			Facet			Facet		
77	G1	8			10			12		
78	Point 1	4.09124	-2.79379	3.18258	3.69818	-2.92223	3.24153	3.24420	-3.02504	3.23954
79	Point 2	4.01214	-2.84817	3.23834	3.63983	-2.96298	3.28365	3.16721	-3.07489	3.28909
80	Point 3	3.98793	-2.83938	3.21628	3.63983	-2.96298	3.28365	3.16395	-3.07385	3.28633
81	Point 4	3.75453	-3.01427	3.40306	3.51489	-3.05022	3.37382	2.92561	-3.22999	3.44252
82	Point 5	5.22942	-4.63324	6.41511	5.13129	-4.70247	6.48702	4.61719	-4.94977	6.68618
83	Point 6	5.73352	-4.52709	6.42964	5.43660	-4.63666	6.49349	5.13524	-4.83496	6.69231
84	Point 7	5.72839	-4.50585	6.39515	5.43660	-4.63666	6.49349	5.13464	-4.83220	6.68785
85	Point 8	5.89808	-4.46565	6.39317	5.58735	-4.60417	6.49668	5.31142	-4.79243	6.68904
86	Point 9	4.09124	-2.79379	3.18258	3.69818	-2.92223	3.24153	3.24420	-3.02504	3.23954
87	Start of scan line	4.26503	-2.91167	3.42532	3.84166	-3.00957	3.42658	3.41287	-3.12422	3.45169
88	Middle of rotation	4.65630	-3.25182	4.08689	4.20000	-3.30000	4.00000	3.71220	-3.35150	3.90711
89	End of scan line	5.66800	-4.26040	5.99609	5.37598	-4.41413	6.12962	5.05851	-4.57920	6.27163
90										

FIG. 15B1



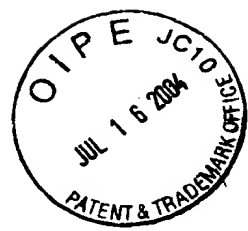
	A	B	C	D	E	F	G	H	I	J
90										
91		Facet			Facet			Facet		
92	G2	7			9			11		
93	Point 1	5.89808	4.46565	6.39317	5.58735	4.60417	6.49668	5.31142	4.79243	6.68904
94	Point 2	5.72839	4.50585	6.39515	5.43660	4.63666	6.49349	5.13464	4.83220	6.68785
95	Point 3	5.73352	4.52709	6.42964	5.43660	4.63666	6.49349	5.13524	4.83496	6.69231
96	Point 4	5.22942	4.63324	6.41511	5.13129	4.70247	6.48702	4.61719	4.94977	6.68618
97	Point 5	3.75453	3.01427	3.40306	3.51489	3.05022	3.37382	2.92561	3.22999	3.44252
98	Point 6	3.98793	2.83938	3.21628	3.63983	2.96298	3.28365	3.16395	3.07385	3.28633
99	Point 7	4.01214	2.84817	3.23834	3.63983	2.96298	3.28365	3.16721	3.07489	3.28909
100	Point 8	4.09124	2.79379	3.18258	3.69818	2.92223	3.24153	3.24420	3.02504	3.23954
101	Point 9	5.89808	4.46565	6.39317	5.58735	4.60417	6.49668	5.31142	4.79243	6.68904
102	Start of scan line	5.66800	4.26040	5.99609	5.37598	4.41413	6.12962	5.05851	4.57920	6.27163
103	Middle of rotation	4.65630	3.25182	4.08689	4.20000	3.30000	4.00000	3.71220	3.35150	3.90711
104	End of scan line	4.26503	2.91167	3.42532	3.84166	3.00957	3.42658	3.41287	3.12422	3.45169
105										

FIG. 15B2



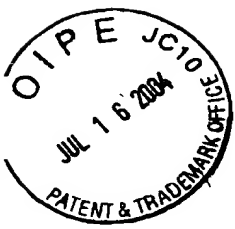
	A	B	C	D	E	F	G	H	I	J
106		Facet			Facet			Facet		
107	G3	1			2			3		
108	Point 1	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445
109	Point 2	7.33669	0.30677	3.72290	7.27018	0.29548	3.93289	7.20014	0.30320	4.16642
110	Point 3	7.35085	0.45214	3.76848	7.27046	0.29830	3.93374	7.20860	0.39685	4.19794
111	Point 4	7.19969	0.19089	4.09695	7.13404	0.12287	4.26827	7.04932	0.16475	4.57132
112	Point 5	6.76168	-2.71194	3.69330	6.69289	-2.84072	3.83654	6.61109	-2.72069	4.17939
113	Point 6	6.82335	-2.91744	3.36219	6.76969	-2.95787	3.51184	6.69286	-2.89597	3.80174
114	Point 7	6.86196	-2.76529	3.33225	6.77043	-2.95493	3.51128	6.71818	-2.79811	3.78090
115	Point 8	6.89054	-2.80469	3.21407	6.79682	-2.99436	3.40022	6.75093	-2.83803	3.64875
116	Point 9	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445
117	Start of scan line	7.32381	0.00361	3.57345	7.25890	0.00056	3.78342	7.19246	0.00004	4.00001
118	Middle of rotation	7.32325	0.00000	3.57301	7.25882	0.00000	3.78335	7.19245	0.00000	4.00000
119	End of scan line	7.01771	-2.11473	3.23472	6.92439	-2.31840	3.41071	6.87855	-2.14504	3.66987
120										

FIG. 15B3A



	K	L	M	N	O	P	Q	R	S
106	Facet			Facet			Facet		
107	4			5			6		
108	7.17887	0.35054	4.26573	7.03508	0.35981	4.74102	6.87159	0.34512	5.26544
109	7.13030	0.29192	4.38726	6.97894	0.30016	4.88659	6.81701	0.28708	5.40695
110	7.13030	0.29192	4.38726	6.97921	0.30354	4.88784	6.81701	0.28708	5.40695
111	7.02005	0.15884	4.66313	6.81288	0.12498	5.31804	6.72143	0.18544	5.65479
112	6.55131	-2.93734	4.23771	6.36745	-2.80040	4.92441	6.22148	-3.06048	5.23666
113	6.61699	-3.02659	3.96692	6.47664	-2.92071	4.49196	6.28421	-3.12902	4.98858
114	6.61699	-3.02659	3.96692	6.47758	-2.91719	4.49112	6.28421	-3.12902	4.98858
115	6.64613	-3.06618	3.84679	6.51493	-2.95743	4.34377	6.32024	-3.16838	4.84610
116	7.17887	0.35054	4.26573	7.03508	0.35981	4.74102	6.87159	0.34512	5.26544
117	7.12389	-0.00002	4.22381	6.97902	0.00007	4.69680	6.82144	0.00006	5.21121
118	7.12389	0.00000	4.22382	6.97901	0.00000	4.69679	6.82143	0.00000	5.21120
119	6.77390	-2.39464	3.85384	6.64346	-2.26763	4.35990	6.44831	-2.50435	4.84743
120									

FIG. 15B3B



	A	B	C	D	E	F	G	H	I	J
75		1			2			3		
76		Facet			Facet			Facet		
77	G1	8			10			12		
78	Point 1	4.09124	-2.79379	3.18258	3.69818	-2.92223	3.24153	3.24420	-3.02504	3.23954
79	Point 2	4.01214	-2.84817	3.23834	3.63983	-2.96298	3.28365	3.16721	-3.07489	3.28909
80	Point 3	3.98793	-2.83938	3.21628	3.63983	-2.96298	3.28365	3.16395	-3.07385	3.28633
81	Point 4	3.75453	-3.01427	3.40306	3.51489	-3.05022	3.37382	2.92561	-3.22999	3.44252
82	Point 5	5.22942	-4.63324	6.41511	5.13129	-4.70247	6.48702	4.61719	-4.94977	6.68618
83	Point 6	5.73352	-4.52709	6.42964	5.43660	-4.63666	6.49349	5.13524	-4.83496	6.69231
84	Point 7	5.72839	-4.50585	6.39515	5.43660	-4.63666	6.49349	5.13464	-4.83220	6.68785
85	Point 8	5.89808	-4.46565	6.39317	5.58735	-4.60417	6.49668	5.31142	-4.79243	6.68904
86	Point 9	4.09124	-2.79379	3.18258	3.69818	-2.92223	3.24153	3.24420	-3.02504	3.23954
87	Start of scan line	4.26503	-2.91167	3.42532	3.84166	-3.00957	3.42658	3.41287	-3.12422	3.45169
88	Middle of rotation	4.65630	-3.25182	4.08689	4.20000	-3.30000	4.00000	3.71220	-3.35150	3.90711
89	End of scan line	5.66800	-4.26040	5.99609	5.37598	-4.41413	6.12962	5.05851	-4.57920	6.27163
90										

FIG. 15C1



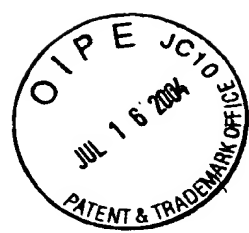
	A	B	C	D	E	F	G	H	I	J
91		Facet			Facet			Facet		
92	G2	7			9			11		
93	Point 1	5.89808	4.46565	6.39317	5.58735	4.60417	6.49668	5.31142	4.79243	6.68904
94	Point 2	5.72839	4.50585	6.39515	5.43660	4.63666	6.49349	5.13464	4.83220	6.68785
95	Point 3	5.73352	4.52709	6.42964	5.43660	4.63666	6.49349	5.13524	4.83496	6.69231
96	Point 4	5.22942	4.63324	6.41511	5.13129	4.70247	6.48702	4.61719	4.94977	6.68618
97	Point 5	3.75453	3.01427	3.40306	3.51489	3.05022	3.37382	2.92561	3.22999	3.44252
98	Point 6	3.98793	2.83938	3.21628	3.63983	2.96298	3.28365	3.16395	3.07385	3.28633
99	Point 7	4.01214	2.84817	3.23834	3.63983	2.96298	3.28365	3.16721	3.07489	3.28909
100	Point 8	4.09124	2.79379	3.18258	3.69818	2.92223	3.24153	3.24420	3.02504	3.23954
101	Point 9	5.89808	4.46565	6.39317	5.58735	4.60417	6.49668	5.31142	4.79243	6.68904
102	Start of scan line	5.66800	4.26040	5.99609	5.37598	4.41413	6.12962	5.05851	4.57920	6.27163
103	Middle of rotation	4.65630	3.25182	4.08689	4.20000	3.30000	4.00000	3.71220	3.35150	3.90711
104	End of scan line	4.26503	2.91167	3.42532	3.84166	3.00957	3.42658	3.41287	3.12422	3.45169
105										

FIG. 15C2



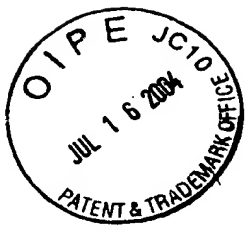
	A	B	C	D	E	F	G	H	I	J
106		Facet			Facet			Facet		
107	G3	1			2			3		
108	Point 1	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445
109	Point 2	7.33669	0.30677	3.72290	7.27018	0.29548	3.93289	7.20014	0.30320	4.16642
110	Point 3	7.35085	0.45214	3.76848	7.27046	0.29830	3.93374	7.20860	0.39685	4.19794
111	Point 4	7.19969	0.19089	4.09695	7.13404	0.12287	4.26827	7.04932	0.16475	4.57132
112	Point 5	6.76168	-2.71194	3.69330	6.69289	-2.84072	3.83654	6.61109	-2.72069	4.17939
113	Point 6	6.82335	-2.91744	3.36219	6.76969	-2.95787	3.51184	6.69286	-2.89597	3.80174
114	Point 7	6.86196	-2.76529	3.33225	6.77043	-2.95493	3.51128	6.71818	-2.79811	3.78090
115	Point 8	6.89054	-2.80469	3.21407	6.79682	-2.99436	3.40022	6.75093	-2.83803	3.64875
116	Point 9	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445
117	Start of scan line	7.32381	0.00361	3.57345	7.25890	0.00056	3.78342	7.19246	0.00004	4.00001
118	Middle of rotation	7.32325	0.00000	3.57301	7.25882	0.00000	3.78335	7.19245	0.00000	4.00000
119	End of scan line	7.01771	-2.11473	3.23472	6.92439	-2.31840	3.41071	6.87855	-2.14504	3.66987
120										

FIG. 15C3A



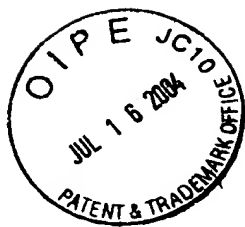
	K	L	M	N	O	P	Q	R	S
106	Facet			Facet			Facet		
107	4			5			6		
108	7.17887	0.35054	4.26573	7.03508	0.35981	4.74102	6.87159	0.34512	5.26544
109	7.13030	0.29192	4.38726	6.97894	0.30016	4.88659	6.81701	0.28708	5.40695
110	7.13030	0.29192	4.38726	6.97921	0.30354	4.88784	6.81701	0.28708	5.40695
111	7.02005	0.15884	4.66313	6.81288	0.12498	5.31804	6.72143	0.18544	5.65479
112	6.55131	-2.93734	4.23771	6.36745	-2.80040	4.92441	6.22148	-3.06048	5.23666
113	6.61699	-3.02659	3.96692	6.47664	-2.92071	4.49196	6.28421	-3.12902	4.98858
114	6.61699	-3.02659	3.96692	6.47758	-2.91719	4.49112	6.28421	-3.12902	4.98858
115	6.64613	-3.06618	3.84679	6.51493	-2.95743	4.34377	6.32024	-3.16838	4.84610
116	7.17887	0.35054	4.26573	7.03508	0.35981	4.74102	6.87159	0.34512	5.26544
117	7.12389	-0.00002	4.22381	6.97902	0.00007	4.69680	6.82144	0.00006	5.21121
118	7.12389	0.00000	4.22382	6.97901	0.00000	4.69679	6.82143	0.00000	5.21120
119	6.77390	-2.39464	3.85384	6.64346	-2.26763	4.35990	6.44831	-2.50435	4.84743
120									

FIG. 15C3B



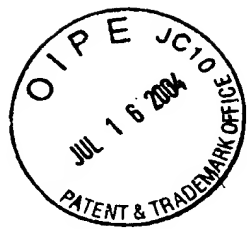
	A	B	C	D	E	F	G	H	I	J
75		1			2			3		
76		Facet			Facet			Facet		
77	G1	8			10			12		
78	Point 1	4.09124	-2.79379	3.18258	3.69818	-2.92223	3.24153	3.24420	-3.02504	3.23954
79	Point 2	4.01214	-2.84817	3.23834	3.63983	-2.96298	3.28365	3.16721	-3.07489	3.28909
80	Point 3	3.98793	-2.83938	3.21628	3.63983	-2.96298	3.28365	3.16395	-3.07385	3.28633
81	Point 4	3.75453	-3.01427	3.40306	3.51489	-3.05022	3.37382	2.92561	-3.22999	3.44252
82	Point 5	5.22942	-4.63324	6.41511	5.13129	-4.70247	6.48702	4.61719	-4.94977	6.68618
83	Point 6	5.73352	-4.52709	6.42964	5.43660	-4.63666	6.49349	5.13524	-4.83496	6.69231
84	Point 7	5.72839	-4.50585	6.39515	5.43660	-4.63666	6.49349	5.13464	-4.83220	6.68785
85	Point 8	5.89808	-4.46565	6.39317	5.58735	-4.60417	6.49668	5.31142	-4.79243	6.68904
86	Point 9	4.09124	-2.79379	3.18258	3.69818	-2.92223	3.24153	3.24420	-3.02504	3.23954
87	Start of scan line	4.26503	-2.91167	3.42532	3.84166	-3.00957	3.42658	3.41287	-3.12422	3.45169
88	Middle of rotation	4.65630	-3.25182	4.08689	4.20000	-3.30000	4.00000	3.71220	-3.35150	3.90711
89	End of scan line	5.66800	-4.26040	5.99609	5.37598	-4.41413	6.12962	5.05851	-4.57920	6.27163
90										

FIG. 15D1



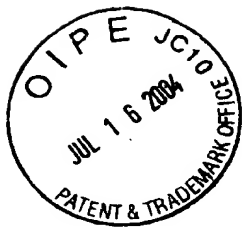
	A	B	C	D	E	F	G	H	I	J
91		Facet			Facet			Facet		
92	G2	7			9			11		
93	Point 1	5.89808	4.46565	6.39317	5.58735	4.60417	6.49668	5.31142	4.79243	6.68904
94	Point 2	5.72839	4.50585	6.39515	5.43660	4.63666	6.49349	5.13464	4.83220	6.68785
95	Point 3	5.73352	4.52709	6.42964	5.43660	4.63666	6.49349	5.13524	4.83496	6.69231
96	Point 4	5.22942	4.63324	6.41511	5.13129	4.70247	6.48702	4.61719	4.94977	6.68618
97	Point 5	3.75453	3.01427	3.40306	3.51489	3.05022	3.37382	2.92561	3.22999	3.44252
98	Point 6	3.98793	2.83938	3.21628	3.63983	2.96298	3.28365	3.16395	3.07385	3.28633
99	Point 7	4.01214	2.84817	3.23834	3.63983	2.96298	3.28365	3.16721	3.07489	3.28909
100	Point 8	4.09124	2.79379	3.18258	3.69818	2.92223	3.24153	3.24420	3.02504	3.23954
101	Point 9	5.89808	4.46565	6.39317	5.58735	4.60417	6.49668	5.31142	4.79243	6.68904
102	Start of scan line	5.66800	4.26040	5.99609	5.37598	4.41413	6.12962	5.05851	4.57920	6.27163
103	Middle of rotation	4.65630	3.25182	4.08689	4.20000	3.30000	4.00000	3.71220	3.35150	3.90711
104	End of scan line	4.26503	2.91167	3.42532	3.84166	3.00957	3.42658	3.41287	3.12422	3.45169
105										

FIG. 15D2



	A	B	C	D	E	F	G	H	I	J
106		Facet			Facet			Facet		
107	G3	1			2			3		
108	Point 1	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445
109	Point 2	7.33669	0.30677	3.72290	7.27018	0.29548	3.93289	7.20014	0.30320	4.16642
110	Point 3	7.35085	0.45214	3.76848	7.27046	0.29830	3.93374	7.20860	0.39685	4.19794
111	Point 4	7.19969	0.19089	4.09695	7.13404	0.12287	4.26827	7.04932	0.16475	4.57132
112	Point 5	6.76168	-2.71194	3.69330	6.69289	-2.84072	3.83654	6.61109	-2.72069	4.17939
113	Point 6	6.82335	-2.91744	3.36219	6.76969	-2.95787	3.51184	6.69286	-2.89597	3.80174
114	Point 7	6.86196	-2.76529	3.33225	6.77043	-2.95493	3.51128	6.71818	-2.79811	3.78090
115	Point 8	6.89054	-2.80469	3.21407	6.79682	-2.99436	3.40022	6.75093	-2.83803	3.64875
116	Point 9	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445
117	Start of scan line	7.32381	0.00361	3.57345	7.25890	0.00056	3.78342	7.19246	0.00004	4.00001
118	Middle of rotation	7.32325	0.00000	3.57301	7.25882	0.00000	3.78335	7.19245	0.00000	4.00000
119	End of scan line	7.01771	-2.11473	3.23472	6.92439	-2.31840	3.41071	6.87855	-2.14504	3.66987

FIG. 15D3A



	K	L	M	N	O	P	Q	R	S
106	Facet			Facet			Facet		
107	4			5			6		
108	7.17887	0.35054	4.26573	7.03508	0.35981	4.74102	6.87159	0.34512	5.26544
109	7.13030	0.29192	4.38726	6.97894	0.30016	4.88659	6.81701	0.28708	5.40695
110	7.13030	0.29192	4.38726	6.97921	0.30354	4.88784	6.81701	0.28708	5.40695
111	7.02005	0.15884	4.66313	6.81288	0.12498	5.31804	6.72143	0.18544	5.65479
112	6.55131	-2.93734	4.23771	6.36745	-2.80040	4.92441	6.22148	-3.06048	5.23666
113	6.61699	-3.02659	3.96692	6.47664	-2.92071	4.49196	6.28421	-3.12902	4.98858
114	6.61699	-3.02659	3.96692	6.47758	-2.91719	4.49112	6.28421	-3.12902	4.98858
115	6.64613	-3.06618	3.84679	6.51493	-2.95743	4.34377	6.32024	-3.16838	4.84610
116	7.17887	0.35054	4.26573	7.03508	0.35981	4.74102	6.87159	0.34512	5.26544
117	7.12389	-0.00002	4.22381	6.97902	0.00007	4.69680	6.82144	0.00006	5.21121
118	7.12389	0.00000	4.22382	6.97901	0.00000	4.69679	6.82143	0.00000	5.21120
119	6.77390	-2.39464	3.85384	6.64346	-2.26763	4.35990	6.44831	-2.50435	4.84743

FIG. 15D3B

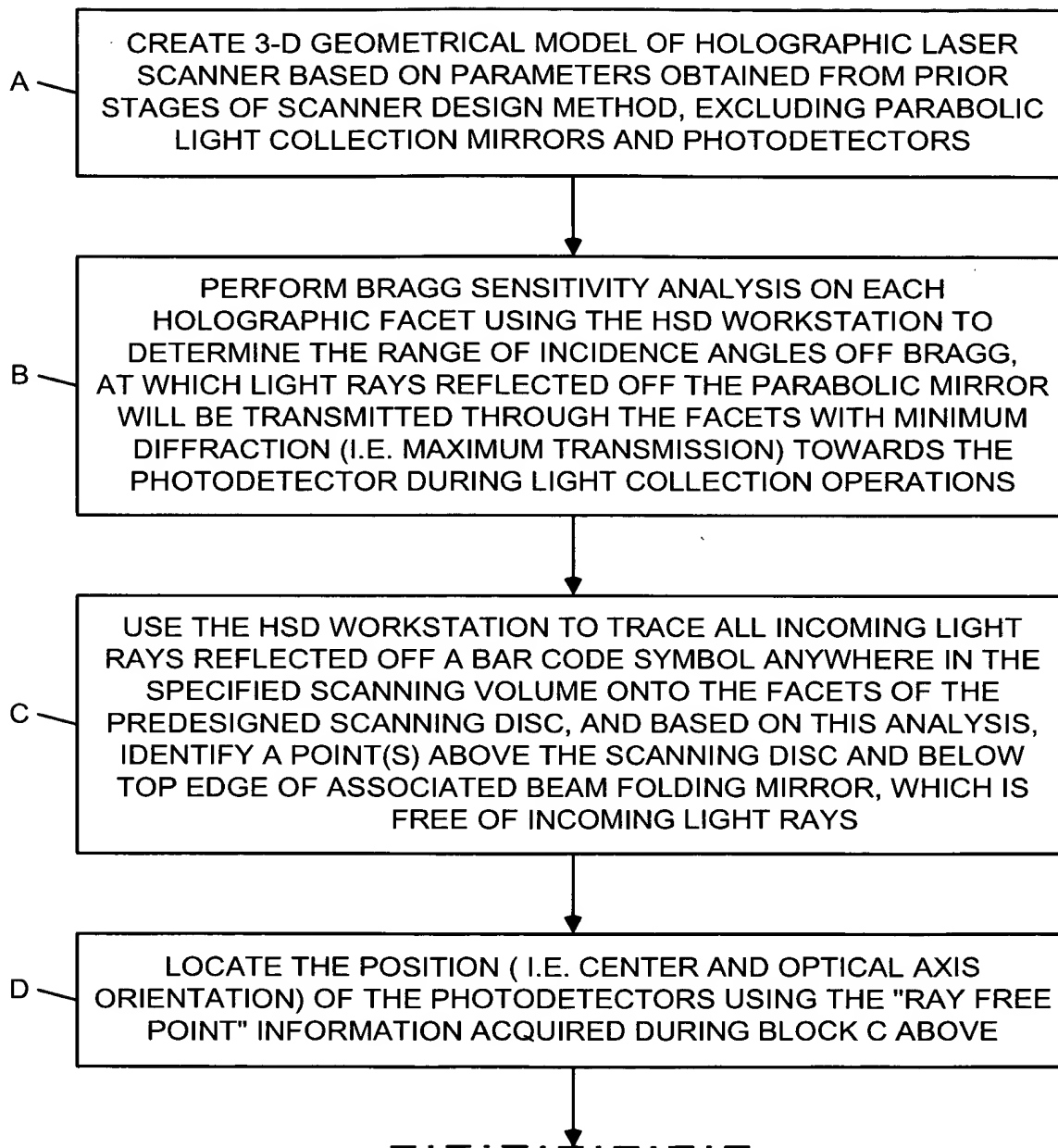
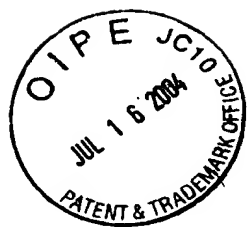


FIG. 16A

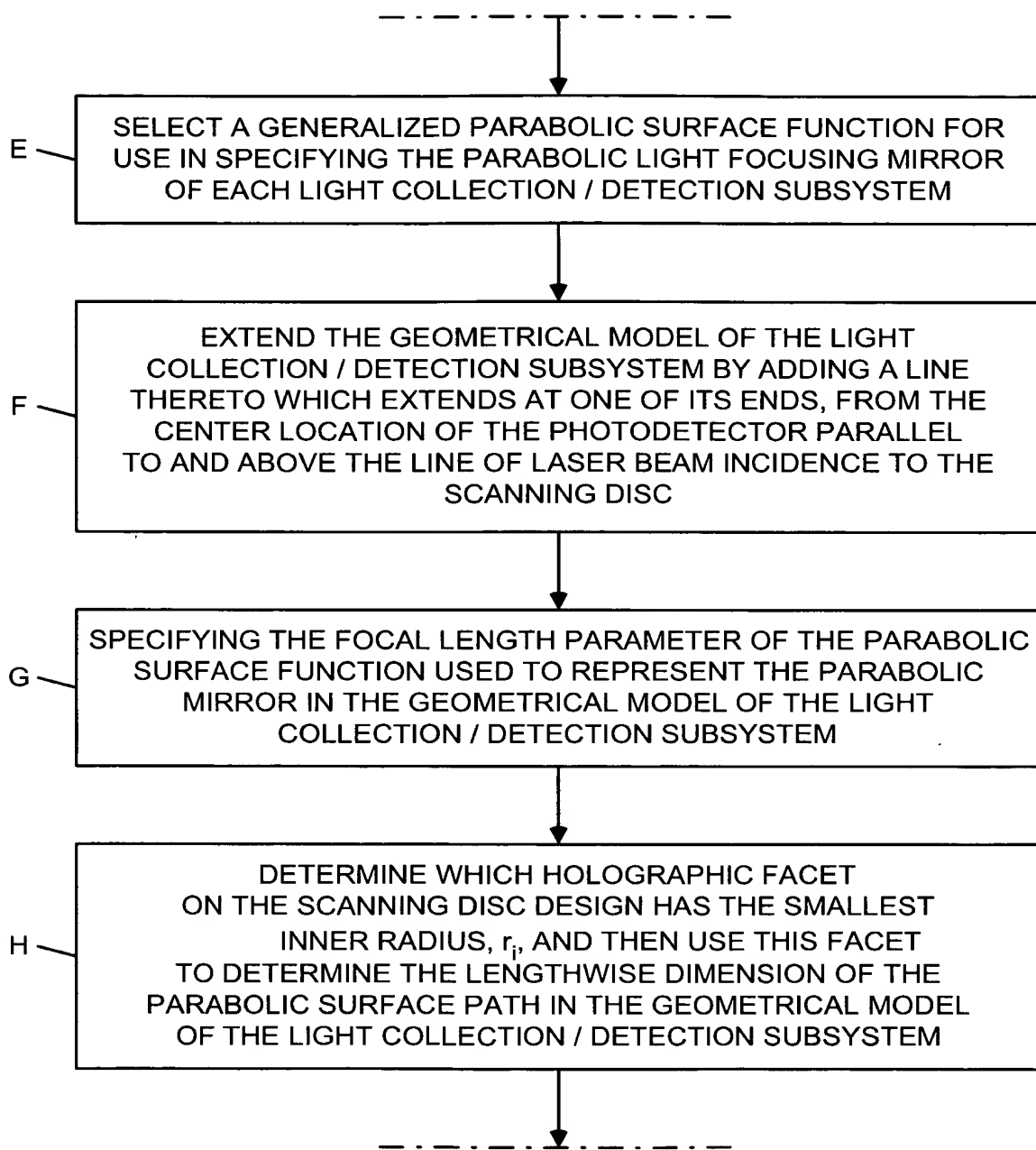
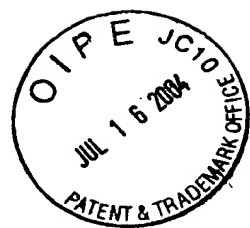


FIG. 16B

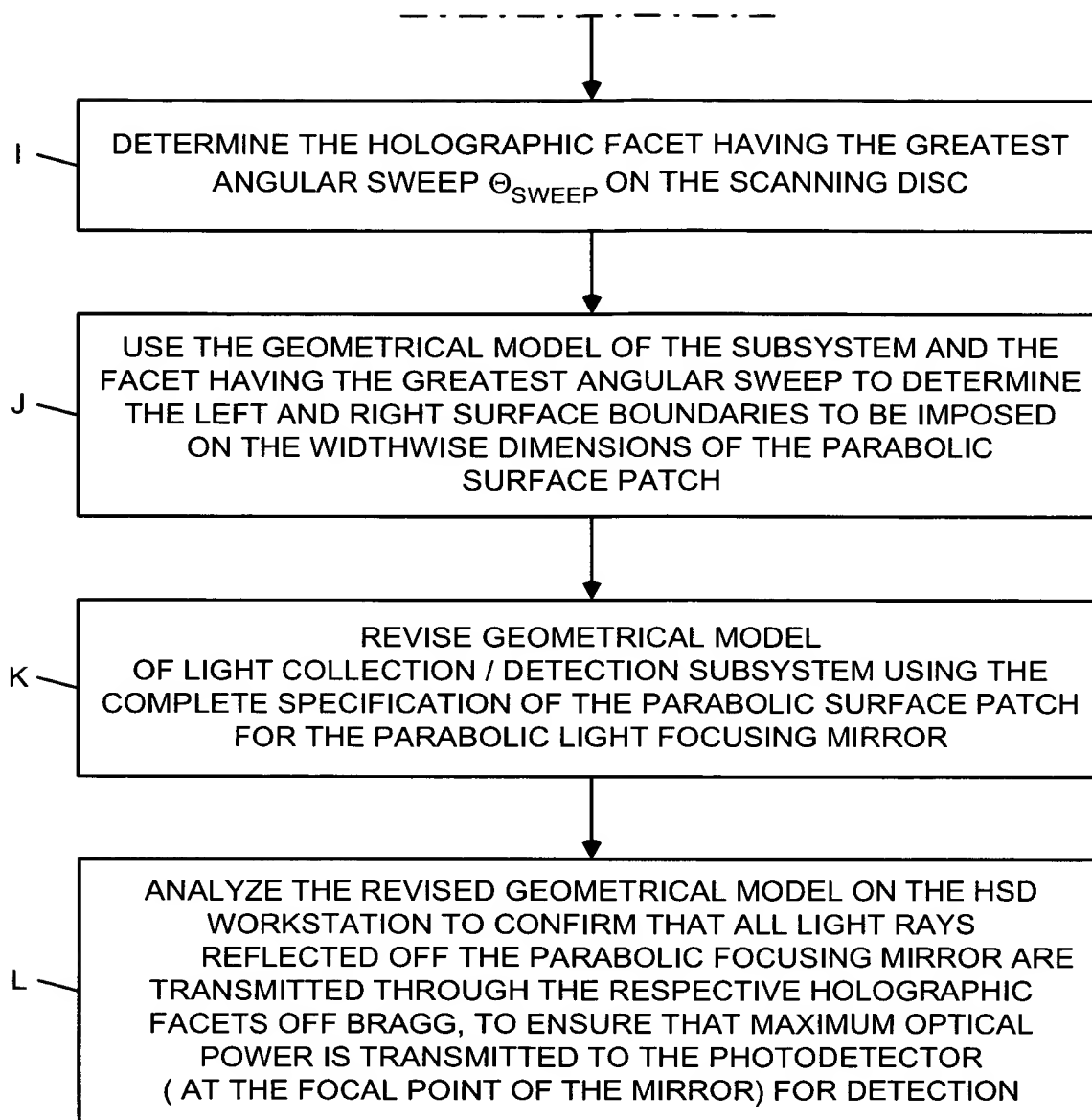
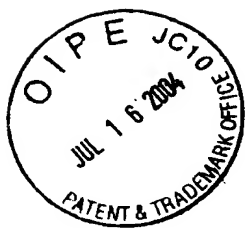


FIG. 16C

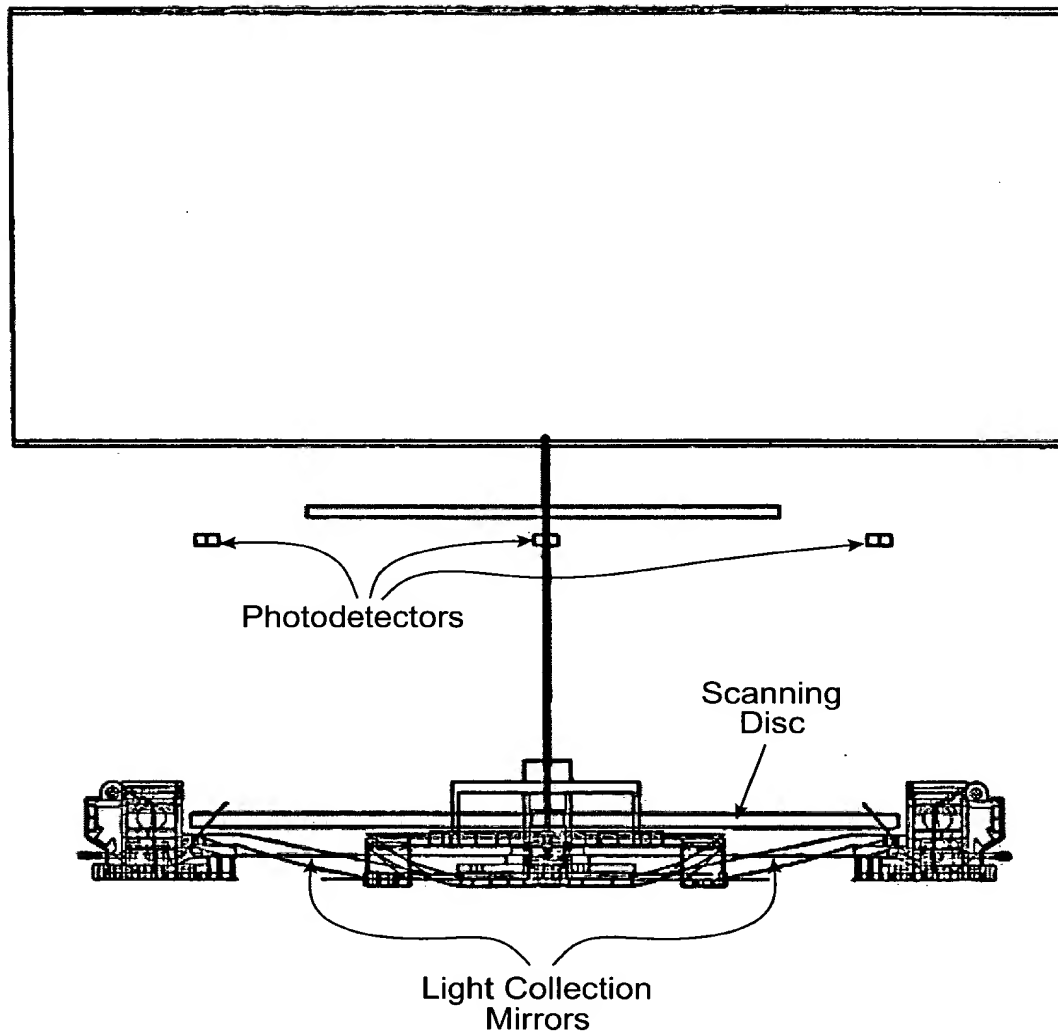


FIG. 17A

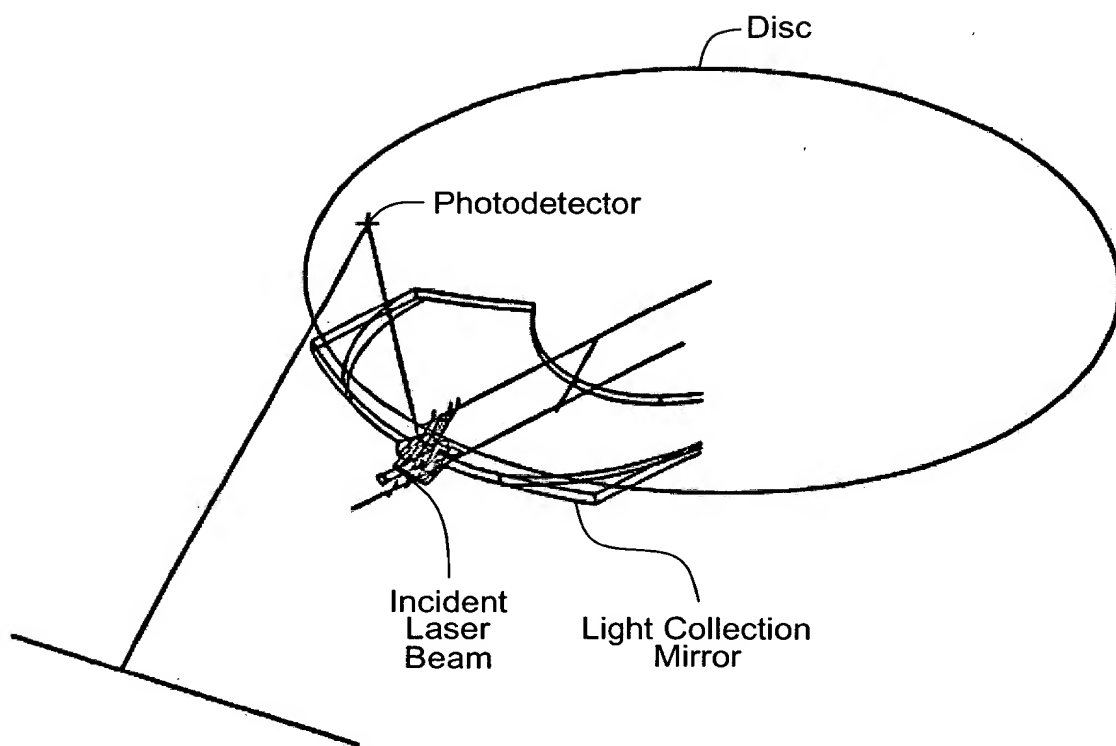


FIG. 17B

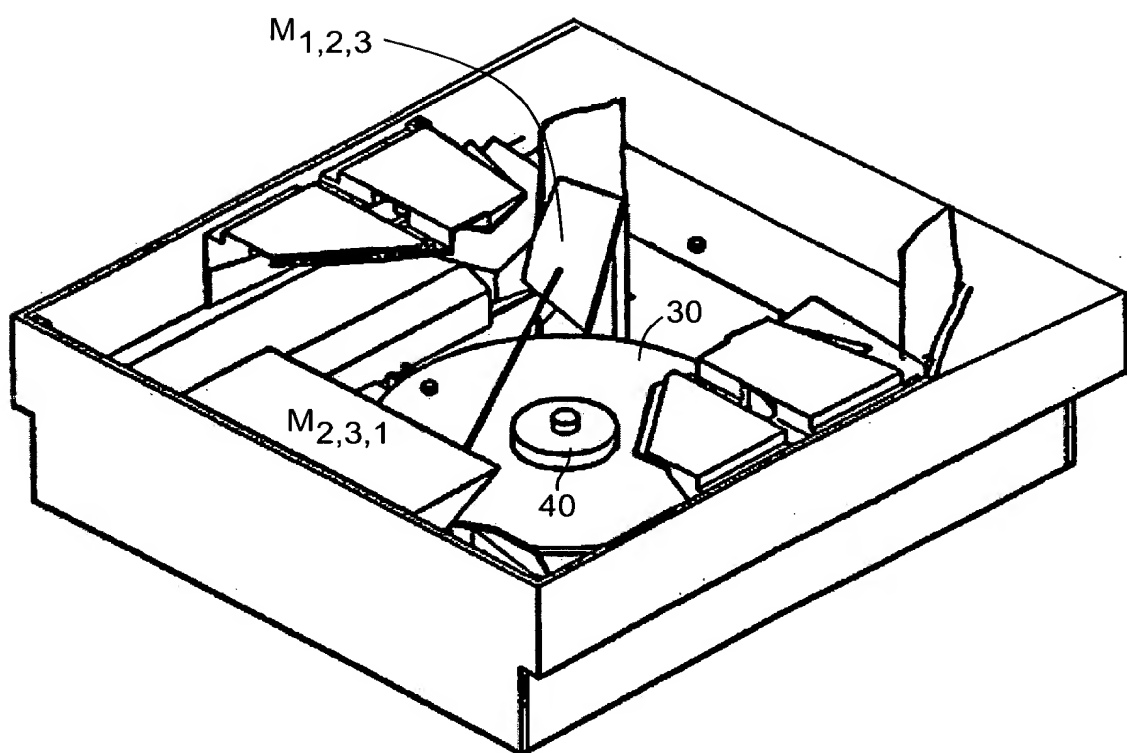


FIG. 18